A TREATISE

OF THE

MATERIA MEDICA

AND

THERAPEUTICS.

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IN TWO VOLUMES.

VOL. I.

FOURTH EDITION, MUCH ENLARGED AND CORRECTED.

Philadelphia:

GRIGG & ELLIOT, 9 NORTH FOURTH STREET.

1834.

Entered according to the act of congress, in the year 1834, by JOHN GRIGG, in the office of the clerk of the district court of the eastern district of Pennsylvania.

Philadelphia:
T. K. Collins & Co., Printers,
No. 6, George Street.

ADVERTISEMENT

TO

THE FOURTH EDITION.

In preparing the present Edition of this work for publication, the Author has spared no efforts to make it as correct and complete as his means and abilities admitted, and to give it renewed claims to the confidence and patronage of the profession. In relation to the natural history and chemical character of many of the articles treated of, much correction was necessary. Such has been the progress of botanical and chemical researches in relation to the Materia Medica, that a work which, but a few years ago, might have exhibited a satisfactory account of the existing knowledge on these subjects, must now be regarded as deficient, and abundant in error. Upon these points, the author has availed himself freely of the various and accurate information embodied in the Dispensatory of the United States, by Drs. Wood and Bache, undoubtedly the most accurate, comprehensive, and, in all respects, excellent publication, of the kind, extant

in the English language. Besides a great many new facts and observations, introduced into the text of the present edition, the chapters on *Iodine*, *Cahinca*, *Artemasii vulgaris*, *Salicine*, *Polygonum hydropiper*, and *Disma crenata*, are now, for the first time, added to the work.

INTRODUCTION.

When we fix our attention upon a diversity of mixed objects, we naturally, and almost unconsciously, begin our inquiries by separating them into groups or families, according to their various analogies or resemblances. We thus obtain a general view of their common and partial relations; and are thereby better enabled to investigate their individual characters, as well as to retain what we have learned concerning them, by the influence of association. We become systematic from the very constitution of the human mind. To classify our ideas is the first step we make towards useful knowledge; and the highest attainments of intellect are but a more extensive and intimate view of the various relations which subsist between the objects of human knowledge.

As things are not viewed under the same aspect by every observer, and relations seen by some, which are either unimportant or unnoticed by others, it follows that arrangements founded on these views are exceedingly various and dissimilar. It is obvious, however, that the classification which includes the greatest number of the conspicuous and constant relations of objects,

must best answer the purposes of such arrangement. The difficulty lies in fixing upon the strongest, most constant, and universal points of resemblance, and to bring them together under such a scheme of arrangement as will exhibit them in the order of their most essential and conspicuous affinities. In arranging the objects of natural science, as, for instance, those of botany, zoology, or chemistry, we bring into view only those natural relations of conformation or character, which subsist among the objects themselves. In medical science, however, we are obliged to enter upon a much more extensive and perplexing range of comparison. Here we must keep in view not only the relations of external agents with each other, but those also which they bear to *living* matter,—to the effects which they produce upon the animal economy. The difficulties which arise from these complicated relations are particularly experienced in the classification of the materia medica; and hence the great imperfection and inadequacy of all the arrangements that have hitherto been proposed in this department of science. Some writers, strongly impressed with the insurmountable nature of these difficulties, have thought it best to reject all systematic arrangement, and to describe remediate substances in an alphabetical order. This simple mode of arrangement, it must be confessed, possesses advantages which cannot be obtained by more artificial classification. We are particularly enabled thereby to exhibit a connected view of all the remedial qualities and therapeutic applications of each individual article,

without the frequent repetitions so unavoidable under every other known system of classification. But to counterbalance this advantage, which, in reality, is of no *essential* importance, we lose sight, by the adoption of such an arrangement, of those general physiological and therapeutic relations between the living body and remedies, which, in themselves highly interesting, serve to give to this department of medicine the character of a science. A few have arranged the articles of the materia medica according to their chemical analogies alone. Burdach uses this mode of classification; but his system is exceedingly complicated and imperfect. Arrangements of the materia medica founded exclusively on the physical properties of medicine are even more objectionable, in every point of view, than the alphabetical order. Without throwing the least light on their therapeutic relations, they are necessarily very complex in their structure, and often bring articles together of the most opposite remedial properties. Cullen's arrangement, which is principally founded upon the general effects of medicinal agents, and partly, also, in its minor sub-divisions, upon their physical relations, is still viewed by many, and I believe, justly too, as the most perfect classification that has hitherto been offered upon this subject. But even this arrangement does not bring into view all those general analogies which subsist between the *effects* of medicinal substances, and which may be used with peculiar propriety as the basis of classic distinctions. Observation teaches us, for instance, that cer-

tain remedies direct their action specifically upon certain organs or structures in the animal economy. These specific affinities between external agents and the various parts of the living body are fundamental, and their notice is essential to a comprehensive and philosophical scheme of arrangement. Cullen, however, overlooked these particular views of the action of remedies, and founded his system on their ultimate medicinal effects alone. Thus the effect of opium in the living system is sleep. The medicine is, therefore, placed in the class of *narcotics*. This is well, so far as it goes. By this arrangement we at once know the *general character* of the effect; but we are not informed as to the particular organ or structure which is principally influenced, and by the peculiar excitement of which the more manifest *effects* are produced. If, however, we place the narcotics, as a genus, under the primary class of "*medicines whose action is specifically directed to the nervous system*," we exhibit at once a general view both of the character of the effect, and of the organ principally concerned with the medicine in its production. Alibert, who saw the propriety of attending to this latter object, adopted a classification founded *entirely* upon the relations which remedial agents bear to particular organs or structures, or, in other words, on their specific tendencies to affect particular parts of the organization. His arrangement is, however, still more objectionable than that of Cullen. It exhibits, it is true, an interesting physiological view of the connexions which subsist between medicinal

agents and the various subordinate systems in the living economy; but it is deficient in the more useful *practical* distinctions derived from the ultimate effects of remedies, constituting the basis of Cullen's classification.

More recently, Dr. Granville, of England, has proposed a new classification of the materia medica, which combines, to a degree, the advantages both of Cullen's and Alibert's arrangements.* His primary or classic divisions are founded on the specific tendency of medicines to act upon particular organs, or systems of structure; and the old divisions of *tonics*, *cathartics*, &c., are introduced as secondary distinctions. This plan of arranging the materia medica appears to me to be superior to any that has hitherto been proposed. Dr. Granville has not, however, been altogether successful, I think, in the particular construction of his classification with regard to its minor divisions. He places stimulants, for instance, in the class of "*medicines that act specifically upon the digestive organs;*" whereas this genus undoubtedly belongs to his third class, which comprises those "medicines that act specifically on the circulating system." It may be said, however, that remediate agents of the stimulant class produce their effects upon the circulatory system, by a specific action primarily exerted upon the stomach; and that the location given to these medicines by Dr. Granville is, therefore, proper. But although these remedies do certainly produce a primary excitement in the stomach, yet this

* Vide London Med. and Phys. Journal, for April, 1822.

primary impression is constantly and specifically directed upon the circulatory system, where it alone becomes obvious. It is this ultimate effect alone which we consider of consequence, or which can be regarded as a manifestation of the action of the stimulant. There are several other objections, of a similar character, which might be urged against the construction of this classification, although its general scheme is unquestionably very good. It forms the groundwork of the arrangement which I have adopted in this treatise, and of which, without any further comment, I subjoin the following synoptical view:

CLASSIFICATION OF THE MATERIA MEDICA.

A. Medicines that act specifically on the intestinal canal, or upon morbific matter lodged in it.
   I. Medicines that excite discharges from the alimentary canal.
      a. *Emetics.*
      b. *Cathartics.*
   II. Medicines calculated to destroy or counteract the influence of morbific substances lodged in the alimentary canal.
      a. *Anthelmintics.*
      b. *Antacids.*

B. Medicines whose action is principally directed to the muscular system.
   I. Medicines calculated to correct certain morbid conditions of the system, by acting on the tonicity of the muscular fibre.
      Tonics.
   II. Medicines calculated to correct certain morbid states of the system, by acting on the contractility of the muscular fibre.

Astringents.

C. Medicines that act specifically on the uterine system.

I. Medicines calculated to promote the menstrual discharge.

Emmenagogues.

II. Medicines calculated to increase the parturient efforts of the womb.

Abortiva.

D. Medicines whose action is principally directed upon the nervous system.

I. Medicines that lessen the sensibility and irritability of the nervous system.

Narcotics.

II. Medicines that increase and equalize the nervous energy.

Antispasmodics.

E. Medicines whose action is principally manifested in the circulatory system.

I. Medicines that increase the action of the heart and arteries.

Stimulants.

F. Medicines acting specifically upon the organs of secretion.

I. Medicines that act on the cutaneous exhalents.

§. General.

a. *Diaphoretics.*

§. Topical.

b. *Epispastics.*

c. *Errhines.*

d. *Emollients.*

II. Medicines that increase the action of the urinary organs.

Diuretics.

III. Medicines that alter the state of the urinary secretion.

Antilithics.

IV. Medicines that promote the secretory action of the salivary glands.

Sialagogues.

G. Medicines that act specifically upon the respiratory organs.

I. Medicines calculated to increase the mucous secretion in the bronchia, and to promote its discharge.
   a. *Expectorants.*
   b. *Inhalations.*

II. Medicines whose action is truly topical.
   a. *Emollients.*
   b. *Escharotics.*

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CHAPTER I.

Observations on the General Modus Operandi of Medicines.

The living economy is under the constant influence of extraneous agents, and subjected, by them, to an infinite variety of impressions. Concerning the essential nature of their action, however, it would be in vain to inquire. All the information attainable, in relation to their modus operandi, is confined, perhaps, to a knowledge of the organs upon which they primarily act; the medium through which their impressions are conveyed throughout the system, and the successive order of the phenomena which result from their operation.

The doctrines which prevail on this subject resolve themselves into the two following positions:

I. All medicines act primarily on the solids; their impressions being conveyed throughout the system by the agency of sympathy.

II. Medicines are absorbed into the circulation, and act on the system through the medium of the blood.

That the animal body possesses the faculty of transmitting impressions from one part to another, is an indisputable fact. Such a power is essential to the preservation of the living economy. The circle of vital actions would soon cease to revolve, were it not for some general connecting medium, by which the various organs of the body are brought into a mutual harmony and correspondence of action. From an examination of the different structures of the animal system, and the functions which they perform, it is evident that the brain and its appendages—the nerves, constitute this medium of connexion; for these alone receive and transmit impressions; and upon them, therefore, depend all those phenomena which are called *sympathetic*. The objection which has been made to this opinion, that sympathies exist between parts of the animal body that have no direct nervous communication with each other, is without foundation; for it must be obvious to every one, on a moment's reflection, that the nervous system brings every sentient and irritable part under the immediate influence of the *sensorium commune*, the brain; and that, therefore, all the parts of the body have a continuous nervous connexion with each other, through the medium of this common centre of feeling. That sympathetic actions are thus propagated through the system, may be inferred from the known laws of nervous excitement. An impression made on the nervous extremities of a part, is either altogether local or insulated in its effects, or it is communicated to the sensorium commune, whence it is reflected either upon the part in which the primary irritation exists, producing sensation in that part; or upon other parts, exciting in them new motions and feelings.

The existence of sympathetic relations, and of their agency in propagating remediate impressions throughout the system, is, therefore, incontestible. It is, however, no less true, that many medicinal articles are absorbed into the circulation, and that they act on the animal economy through the medium of the blood.

It may not be improper to enter into a particular examination of the grounds upon which this opinion is founded, and of the objections that have been urged against it; more especially as it has of late years been warmly contested and rejected as "a relic of the humoral pathology."

Before entering more directly upon the proofs of the admission of remedial substances into the circulation in an indecomposed state, I shall make a few observations concerning the so common want of success in detecting, in the blood, certain substances received into the stomach, or otherwise subjected to the action of the absorbents. Dr. Wollaston states, that he gave a person three and a-half grains of prussiate of potash repeated every hour to the third time. The urine being examined every half hour, was found, in two hours, to be tinged, and to afford a deep blue at the end of four hours. But in the serum of the blood which was *then* drawn, no prussiate could be detected. This experiment is extremely fallacious. In the first place, it is to be observed that probably but a small portion of the ten and a-half grains of the prussiate received into the stomach, was taken up by the lacteals. But this small portion could not have entered the circulation at once; it must have been introduced very gradually into the chyle; and as the kidneys, no doubt, commenced throwing it off, as soon as any part of it was present in the circulation, it is obvious that but a very minute quan-

tity indeed could, at any particular time, have existed in the blood. It is, therefore, not to be wondered, that he could not detect this substance in the serum of blood drawn after the greater part of that which had been absorbed had already appeared in the urine, and consequently passed out of the circulation; for the portion of the prussiate present in the blood, was not only very small, but diffused, moreover, through a mass of at least twenty-four pints of fluid. The urine, on the contrary, having gradually collected the prussiate, held in less, perhaps, than a pint, a much greater quantity of this substance than could have been present at any one time in the whole mass of the blood. Now, from the experiments of professor Mackneven, it appears that it requires one-eighth of a grain to two ounces of serum, before it can be detected by the most delicate tests.* It would, therefore, require more than ten grains of this substance in the blood, before it could be detected, supposing the serum to amount to about twelve pints. Hence, it is evident that no inference can be drawn from experiments of this kind, that can justly be regarded as militating against the opinions I am advocating. I have detected one-sixtieth of a grain of the prussiate in one ounce of urine; which accounts for the ease with which this substance is detected in this secretion, whilst in the serum it escapes our tests.

It may also be observed, that the articles usually employed in experiments of this kind, have a tendency very rapidly to pass off by the kidneys. It would seem that almost as soon as some of them arrive in the circulation they are again thrown off by the emunctories;

* Experiments for ascertaining the permanency of chemical compounds in their passage through the fluids, in the New York Medical and Physical Journal, June, 1822.

and hence, although the urine may become highly charged with such substances, yet the blood, being so soon deprived of them again, shall contain but a very minute portion, diffused, too, through a large mass of fluid. Hence, also, we have an explanation of the fact, that certain substances, after having been received into the stomach, or injected into the cavity of the abdomen, may be detected in the mesenteric veins, vena portarum, splenic veins, and thoracic duct, whilst in the blood generally no traces of their presence can be discovered. For, as many of the abdominal lymphatics open directly into the veins just mentioned, it is evident that the substances which these lymphatics absorb and convey into the veins in question, must be in a much less diluted state than they can be after becoming mixed with the general circulating mass. If we admit the existence of venous absorption, an opinion advocated by very high authority,* this explanation will be still more satisfactory.

Great, however, as are the difficulties connected with experiments of this kind, we are not without many well authenticated facts which prove the admission of foreign substances into the circulation. In the chyle of the thoracic duct, Musgrave, Lister, and Blumenbach detected substances which had been thrown into the intestines of animals. But not to dwell on the testimony offered upon this subject by the older writers, we are furnished with abundant evidence of this physiological fact by the researches of many of the most enlightened physiologists of the present day. The experiments of Mayer,† of Home,‡ of Magendie,§ and the more recent

* Magendie, Emmert.

† In Meckle's Archiv für die Physiologie.

‡ Philosoph. Trans. for 1811.

§ Précis Elementáire de Physiologie.

and satisfactory researches of professors Tiedeman and Gmelin* do not leave any doubt on this point. The experiments of the two latter physiologists prove, in a direct and conclusive manner, that almost all the substances usually found in the urine, after having been taken into the stomach, may be detected also by proper management, in the blood of the vena portæ, the splenic and mesenteric veins. These facts have been lately confirmed, by an extensive course of experiments on this subject by Drs. Harlan, Coates, and Lawrence of this city. From the interesting and well-digested report which these gentlemen have just published, it appears in positive evidence that camphor may, and does pass through the circulation. Having given a tabular view of sixteen experiments on living animals, they observe: "It is impossible to look over the above table without being struck with the obvious manner in which they indicate the route by which the chemical substance (prussiate of potassa) experimented on, entered the circulation. In nearly every instance in which *it was found in the blood*, the contents of the thoracic duct, if examined, exhibited it in a much more obvious degree."† Still more recently, professor Macneven, in the paper already quoted, has published the results of some experiments, which are entirely confirmatory of those just mentioned. "I triturated," says he, "one drachm of crystallized hydrocyanate of potassa with fresh butter and crumbs of bread, which being made into a bolus, the same dog swallowed and retained. Between three and four hours after, Dr.

* Versuche übur die wege, auf welchen substanzen aus dem magen und Darmcanal ins blut gelangen, u. s. w. Von. F. Tiedeman, M. D. und L. Gmelin, M. D. Heidelberg, 1820.

† Philadelphia Journal of the Medical and Physical Sciences, for Feb. 1822.

Anderson bled him largely from the jugular vein. A dose of hydrocyanic acid was then administered, of which he died without pain, and the abdomen was laid open. The lacteals and thoracic duct were seen well filled with milk-white chyle. On scratching the receptaculum, and pressing down on the duct, nearly half a teaspoonful of chyle was collected. Into this were let fall a couple of drops of the solution of permuriate of iron, and a deep blue was the immediate consequence." In another experiment of this kind Dr. Macneven found that, "whenever the mesenteric vessels of the external coats of the intestines were lightly scratched with the scalpel and touched with the solution of permuriate of iron, a strong blue was immediately exhibited."

The facts which have already been detailed, are, I think, quite conclusive on this point. It may not, however, be uninteresting to adduce a few other observations in evidence of the admission of foreign substances into the circulation. Emmert, an eminent German physiologist, relates an experiment,* in which he passed a ligature round the abdominal aorta of an animal, and inserted the prussic acid into its legs. The extremities became cold, but some portion of contractility and sensibility remained. In seventy hours after its application the ligature was removed, and the effects of the poison immediately showed themselves. Similar experiments were performed with the poison *woorara*, by Mr. Brodie.† "He exposed the sciatic nerve of a rabbit in the upper and posterior part of the thigh, and passed under it a tape half an inch wide. He then made a wound in the leg, and having introduced into it some of the *woorara* mixed with water, he tied the tape mode-

* Archiv für die Physiologie, Von I. F. Meckle.

† Philosophical Magazine, June, 1811.

rately tight on the forepart of the thigh. He thus interrupted the communication between the wound and the other parts of the body, by means of the vessels, while that by means of the nerves still remained. After the ligature was tightened, he applied the *woorara* a second time in another part of the leg. The rabbit was not affected, and at the end of an hour he removed the ligature. Being engaged in some other pursuits, he did not watch the animal so closely as he could otherwise have done, but twenty minutes after the ligature was removed, he found him lying on one side, motionless and insensible, evidently under the influence of the poison." It appears, therefore, that the poisons employed in these experiments were not able to affect the system until they had entered the general circulation. Brodie's researches render it, indeed, extremely probable that *woorara*, as well as several other poisons, produce their deleterious effects on the animal economy, by acting directly upon the brain, through the medium of the blood, and that they are not injurious unless they are absorbed into the blood-vessels.

Besides the evidence of direct experiment, there are many other facts mentioned in the writings of physicians, which go to prove the absorption of foreign substances into the circulation. The effects of the internal use of nitrate of silver on the skin, strikingly illustrates this fact. A considerable number of cases have been related, on the most respectable authority, in which the skin acquired a very dark, and, in some instances, quite a black colour, from the long continued use of this medicine.* It is well known, too, that medicines taken by nurses very often produce the same effects upon their suckling infants, as if these had taken the

* Lond. Med. Reposit. vol. v. May, 1817.

medicine directly into their stomachs. It is a fact equally well known, that the milk of cows becomes imbued with the odour and taste of the vegetables on which they feed.

I am well aware, that many deny that these facts can be regarded as evidence of the transmission of foreign substances into the circulation. It is said, for instance, that the process of digestion and assimilation completely decomposes all substances subjected to its influence; that, consequently, elementary particles only are admitted into the blood-vessels; and that these are recombined, and again rendered conspicuous when thrown into the secretions.

That substances taken into the stomach, or otherwise subjected to the action of the absorbents, are not necessarily decomposed before they are admitted into the circulation, is fully demonstrated by what has already been said.

Admitting, however, that the assimilating powers do decompose the substances subjected to their action, it does not, I think, form any valid objection to the doctrine alleging that the blood may become imbued with properties capable of producing remediate or morbific impressions, in consequence of disease or the admission of certain substances into the circulation. When the milk, urine, flesh, &c. become impregnated with the peculiar qualities of substances taken into the stomach, the blood, from which these secretions are formed, must have contained either the substances themselves or their elements. It is evident, however, that blood which contains such elements, contains parts which do not belong to it in its natural and healthy state. Thus, in the instance given above, in relation to the discoloration of the skin by the internal use of the nitrate of silver, if

this substance were previously decomposed, and again regenerated in the skin, as has been alleged, we should then have silver, oxygen, and azote floating each in a separate state in the blood, and without which no nitrate of silver could possibly be afterwards regenerated in the cutaneous vessels.

In opposition to the opinion that remediate substances enter the circulation in an active state, it is moreover asserted in a late work on the Materia Medica, that "chyle, however diversified the materials may be out of which it is formed, whether animal or vegetable, has essentially an identity of nature." This assertion is entirely gratuitous, and contradicted by direct experiment. Dr. Marcet found that chyle formed from vegetable food contains nearly three times as much carbon, as that which is formed from animal food; and that the chyle from animal substances, for the most part, enters into putrefaction in three or four days, whilst that from vegetables remain unchanged for weeks, or even months. It appears also from these experiments, that chyle from animal food is milky, and on standing, becomes covered with a cream-like substance; whilst that from vegetable food is generally transparent, resembling common serum with a coagulum almost colourless, and does not collect a creamy substance on its surface.* There is, therefore, a very striking difference between the chyle formed from animal and vegetable substances.

It has also been objected, "that it is incompatible with animal life that such active substances should be received into the circulation, since milk and other bland fluids have been known, when injected into the vessels, to occasion immediate death." It cannot be denied

* Medico-Chirurg. Transact. vol. vi. p. 630.

that substances *forced* into the circulation by a *syringe*, and of a reduced temperature, may, and in fact generally do, occasion death. Such violent effects do not, however, always follow experiments of this kind. Drs. Smith, Wahrendorf, Borrichius, Magendie, and others, injected medicines into the veins of persons, and found them to produce the same effects as if they had been received into the stomach. Sir E. Home performed similar experiments, and demonstrated anew that remediate substances may be thus introduced into the system, not only without fatal consequences, but with the same effects as if they had been taken internally. The experiments of Dr. Smith and Sir E. Home are published in the Transactions of the Royal Society of London.

Although the introduction of foreign substances into the circulation, by means of an injecting apparatus, often gives rise to dangerous or fatal consequences, it does not follow that the same violent effects must ensue from the introduction of the same articles into the blood, through the regular route of the absorbents. In the one case, the substance introduced is suddenly and forcibly urged into the blood-vessels; whereas, in the other, it passes into the veins, drop by drop, without any unnatural impetus, enveloped in bland and congenial fluids possessing the precise temperature of the blood. In confirmation of the correctness of this view, we need only advert to the fact, that chyle itself, when *injected* into the blood-vessels, will sometimes produce the same injurious effects that follow the introduction of other articles in the same way.

It has been said, also: "By the medication of the blood, were it possible, as is contended for, we must, in all instances, do harm. The whole mass of the circulating fluids is equally charged in this case with the medicinal substance, and therefore, while an action is

going on in a diseased organ which may be salutary as to it, every sound part of the system becomes subjected to a similar impression, which could not fail to disturb the order of health, and create morbid derangements." To this hypothetical objection, I will oppose the observations of one of the editors of the New York Medical and Physical Journal. "That every organ in the body," says the writer, "has its peculiar and appropriate stimulus, by which it is excited into action, is so universally admitted as to require no process of reasoning to establish it. If this be so, then there can be but little difficulty, we think, in conceiving that a substance dissolved in the blood may circulate through the system, without producing any particular effects until it reaches the organ upon which, from its peculiar properties, it is designed to operate. The reason why a medicine acts upon one organ, in preference to all the other organs of the body—why jalap, for instance, operates upon the intestines, and not upon the brain and lungs,—we can no more explain than we can the reason why the planets are kept revolving in their orbits. If we are told that the movement of the planets are the result of attraction, so we may say that the determination of medicines to certain organs is occasioned by a similar attraction. This, however, explains nothing, and we must, after all, be content with the broad fact, that such phenomena do occur, and that they are governed by certain laws; but the *cause why* they occur must forever remain concealed."

From the foregoing observations, therefore, it is, I think, perfectly evident, that medicines may produce remedial impressions in both the ways mentioned in the beginning of this chapter. This, indeed, is the generally admitted doctrine on this subject, with those who have kept pace with the progress of medical science.

CHAPTER II.

A. MEDICINES THAT ACT SPECIFICALLY ON THE INTESTINAL CANAL, OR UPON MORBIFIC MATTERS LODGED IN IT.

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1. *Medicines that Excite Discharges from the Alimentary Canal.*

EMETICS.

An emetic is a substance which excites vomiting by a specific impression on the stomach, independent of mere distention from quantity, or of nauseous taste or smell.

With regard to the *mechanism* of vomiting, experiments, apparently equally correct and conclusive, have led to very opposite results. *Chirac*,* a French physician of the 17th century, published an account of some experiments he had performed on living animals, with the view of ascertaining the particular process of vomiting. The conclusions which he drew from his experiments are: that in the act of vomiting the stomach is quiescent, and that its contents are ejected solely by being forcibly compressed between the diaphragm and abdominal muscles. Magendie, without alluding to the experiments of *Chirac*, has drawn the same conclusions, from a set of experiments he has lately performed on this subject. The experiments of

* Historie de l' Academie Royale des Sciences, p. 12, an. 1700.

Haighton, on the contrary, seem to prove, very conclusively, that vomiting is chiefly, if not entirely, effected by the contraction of the muscular coat of the stomach; and this is the opinion now almost universally entertained. There can, however, be but little doubt, that all the powers which have been mentioned, conspire to produce the act of vomiting. The stomach contracts; its peristaltic action is inverted; the diaphragm and abdominal muscles are brought into action, and thus, by the combined agency of all these powers, emesis is produced.

How do emetics excite the actions of the stomach and muscles concerned in the process of vomiting? The speculations of Darwin on this subject, though, perhaps, untenable upon the whole, are not without considerable plausibility. He alleges that the excitement of the stomach is greatly diminished by the action of an emetic; in consequence of which its peristaltic motion becomes inverted. When nausea is produced, (says he,) the stomach, as well as the whole system, is in a state of temporary debility. As the nausea increases in intensity, the natural powers of the stomach are more and more diminished, until they cease altogether, and give rise to an inverted motion of its muscular fibres. In confirmation of this view of the subject, he refers to the vomiting produced by causes manifestly debilitating, such as syncope, concussion of the brain, &c.

It is impossible to ascertain the precise nature of the changes which take place in the living system from the operation of extraneous causes. All that we can hope to arrive at in this respect, is a knowledge of the general character and order of phenomena; a point, indeed, which it is but seldom allowed us to attain. When an agent is applied to the system, a longer or shorter train of actions take place intermediately between its

application and its ultimate or characteristic effect. In proportion as we trace the successive links in the chain of actions which proceeds from the operation of a remedy, so do we succeed in obtaining a knowledge of its modus operandi. With regard to the operation of emetics, therefore, we may trace, I think, the following series of actions. The emetic, in the first place, makes an impression on the sentient extremities of the stomach. This impression is immediately referred to the sensorium commune; in consequence of which its natural energies are diminished, as is evinced by the languor of both the intellectual and corporeal powers. But as the sensation of an irritated organ depends, in reality, directly on a peculiar excitement in the sensorium commune, so we may infer, that the sensation of nausea is the immediate and necessary result of the diminished and peculiar excitement of the brain, referred to the stomach. That this is, in fact, the case, is demonstrated by the vomiting and nausea which are sometimes excited at the sight, smell, taste, or even the thought of a disgusting object. Here, however, our progress is arrested. For we can trace no necessary connexion between nausea and the mechanical process of vomiting. We know not why a certain degree of nausea produces contractions of the organs concerned in this act, any more than we know why a certain degree of venereal excitement calls into action the muscles concerned in *ejectione seminis*. These are mysteries, locked up in the bosom of our Creator, concerning which it would be idle to speculate.

When an emetic is taken, an uneasy sensation is first experienced, which is sooner or later followed by nausea; this gradually grows stronger and stronger, while the pulse becomes feeble, frequent, and irregular; the

face turns pale, and the skin becomes cold and shrunk; vomiting finally comes on, during which the face is red and turgid with blood. On the cessation of the vomiting the sickness goes off, leaving the system in a state of temporary languor, from which it soon recovers.

Contrary to what takes place with the operation of other articles on the animal economy, emetics increase, by repetition, the susceptibility of the stomach to their impressions. Cullen states that he knew a person so accustomed to excite vomiting in himself, that the one-twentieth of a grain of tart. antim. was sufficient to cause a convulsive action of the stomach.

The evacuation produced by an emetic is not confined to the stomach, but extends occasionally also to the duodenum; and even further. During the act of vomiting, there must be considerable pressure exerted upon the liver and gall-bladder, by the contraction of the diaphragm and abdominal muscles. In consequence of this, a more copious discharge of bile into the duodenum takes place;* and this effect is promoted by the relaxation produced in the common duct by the previous nausea. Being thus more copiously thrown into the duodenum, during the first efforts of vomiting, the bile is readily conveyed to the stomach, both by the inverted motion of the intestine, and the pressure of the abdominal muscles. It is obvious from this, that, although the contents of the stomach may at first be thrown off free from any admixture of bile, yet after one or two acts of vomiting, by which the contents of the duodenum are forced into the stomach, this fluid may be copiously discharged. When, therefore, we do not observe any bile in the fluid thrown off, until several full evacuations have occurred, we may conclude

* Cullen's Materia Medica.

that it did not previously exist in the stomach, but was brought into it by the preceding acts of vomiting.

In cholera, we generally find no bile in the discharges, until vomiting has continued for some time. In this case, the bile is probably furnished from the gall-bladder, which being compressed by the action of the diaphragm and abdominal muscles, during vomiting, pours its contents into the intestines, and thence into the stomach. From this circumstance, we derive a caution against the imprudent repetition of vomits, on finding bile in each succeeding discharge, under the fallacious idea of expelling the whole of it from the primæ viæ.

Evacuation of the contents of the stomach is by no means the only remedial effect which may result from this class of medicinal agents. By agitating and compressing the contents of the abdominal viscera, vomiting gives an impulse to the portal circulation—an effect which, in certain diseases, connected with a sluggish and congested state of this system of blood-vessels, is often highly salutary. Emetics may moreover prove beneficial, by the general shock or excitement which they produce in the nervous system. It is by an influence of this kind, perhaps, that they are sometimes capable of arresting the progress of febrile affections, when administered in their forming stage, while the morbid excitement is as yet principally confined to the nervous system.

The operation of emetics is generally attended with an *increased activity of the absorbents*. The experiments of Magendie have established the physiological fact, that the rapidity of absorption bears an inverse ratio to the fulness and activity of the sanguiferous system. When the blood-vessels are in a state of repletion or

of vigorous action, absorption goes on very imperfectly; and, on the other hand, when the circulation is feeble, or the vessels in a state of depletion, the action of the absorbents is generally much increased. It is, doubtless, by an effect of this kind, namely, a reduction of the momentum of the circulation, that emetics increase the absorption of effused fluids. If this be the mode in which emetics increase absorption, it seems evident, that those articles of this class of remedies which cause the greatest degree of nausea, must be most efficient in reducing hydropic accumulations; for it is chiefly by the nausea which emetics produce, that they occasion any obvious reduction of the momentum of the circulation. At the same time that absorption is thus increased by an enfeebled state of the circulation, the reduction of effused fluids may be further increased by diminished exhalations; for it seems reasonable to presume, that when the action of the heart and arteries is materially diminished, exhalation, also, will suffer a corresponding decrease.

In prescribing emetics, attention should be paid to the following circumstances:

1. Unless an urgent necessity exists for the immediate evacuation of the contents of the stomach, emetics should be administered in under doses, repeated at short intervals, until the desired effect is produced. The susceptibility of the stomach to the impressions of emetics, varies very greatly in different individuals, or in the same individual at different times. A dose scarcely sufficient to excite nausea, in one person, or at one time, would produce hyper-emesis in another, or in the same person at another time. By giving the emetic in small portions, repeated at suitable intervals, we may, in a great measure, control its operation, and produce the desired degree of emesis.

2. In plethoric subjects—in such as are predisposed to apoplexy, particularly when signs of undue fulness of the vessels of the head exist—and, in general, where the momentum of the circulation is great, blood ought to be abstracted, previous to the administration of emetics. Without this precautionary measure, serious and even fatal accidents might result from the forcible propulsion of the blood into the brain, by the exertions attending the operation of an emetic. Apoplexy, palsy, and convulsions have thus been suddenly produced.

3. During the operation of an emetic, the patient should drink warm diluents, such as lukewarm water, chamomile tea, and weak infusion of eupatorium perfoliatum—more especially when the principal purpose is to procure the removal of offensive substances from the stomach.

4. The patient should be cautioned against taking cold water during or soon after the operation of the emetic. I have known two instances of speedy death produced by cramp of the stomach, in consequence of a draught of cold water immediately after the operation of a dose of tartar emetic.

5. For at least twenty-four hours after the operation of an emetic, the diet should be simple, unirritating, digestible, and moderate in quantity.

From the extensive influence of this class of remedies on the animal economy, it may be readily conceived, that their remediate application must be various and important. In a great number of diseases, indeed, they are indispensable, at some period or other of their progress. I now, therefore, proceed to give a more particular detail of their practical application.

Emetics constitute a very important class of remedies in febrile diseases. In the treatment of typhus, when

exhibited in the forming stage of the disease, they sometimes arrest its progress in a very prompt manner. "Antimonial emetics," says Dr. Armstrong, "have been very generally recommended in typhus fever, and, according to my observation, are serviceable when the fever is of the least complicated form, commonly producing an improvement in the condition of the skin, respiration, and pulse in particular; and, perhaps, it is on the power which they possess of determining the blood to the surface, and of changing the morbid states of the circulation, that their efficacy depends."

In typhus pneumonica, I have derived much advantage from emetics. They appeared to be particularly serviceable where much distress and pain in the thorax, with signs of internal congestion, were present. In such cases they promoted expectoration, and tended to re-establish the equilibrium of the circulation. They appeared, moreover, to render the system more susceptible to the operation of stimulants. "In the typhoid and typhus pneumonica," says professor Potter, "that occasioned such lamentable mortality, of late years, throughout the United States, emetics, judiciously employed, were more beneficial than any other remedy. It was, indeed, a novel spectacle to those who were accustomed to unsheath the lancet in almost every thoracic affection, to behold a pneumonic fever, perhaps an hæmoptoe, removed by the incantation of a single emetic."

Emetics have also been recommended in the various forms of malignant fever. In the beginning of some fevers of this character, they may occasionally prove beneficial, though, as a general rule, they are of doubtful propriety, even in the earlier stages of such fevers; and, in their advanced periods, for the most part,

injurious. In fevers of this character there is always a very strong tendency to inflammatory irritation of the mucous membrane of the alimentary canal; and, in nearly all cases, such a state of irritation or phlogosis occurs in the advanced periods of the disease. It seems obvious, therefore, that emetics cannot be resorted to in fevers of this kind, without considerable risk of doing injury; for it cannot be doubted, that where there is a strong tendency to mucous inflammation of the stomach, the irritating impressions of an emetic must tend, very materially, to promote the supervention of this unfavourable condition. General experience, in fact, has decided against the employment of emetics in fevers of this character, except, perhaps, in the forming stage, at which period they may, doubtless, often be useful, by the shock and a new excitement which they give to the nervous system, and by obviating or removing internal visceral congestions.

In intermittents, vomits are a very common remedy. They, indeed, sometimes put a stop to the disease, without the employment of any other medicine. There exists some difference of opinion with regard to the importance of exhibiting emetics, as a preparative to tonic remedies. Judging from my own experience, I am led to believe that an emetic will, in general, render the subsequent employment of bark more certainly successful; and this seems to be in accordance with the sentiments of many of the best writers on this subject. Independent of the general impression which emetics produce on the system, and which, of itself, must aid in breaking through the chain of morbid associations, they appear to render the stomach more sensible to the impression of other remedies, and consequently to give them a greater chance of displaying their remedial powers.

In some of the exanthemata, emetics are often of essential service. They are especially useful in the *early* stage of scarlatina, both in its simple and malignant forms. When aided by the warm bath, they tend to "free the system from the pressure of the plethora of the internal blood-vessels, so frequently observed in the commencement of this disease, and by thus equalising the whole circulation, to render the future case most commonly mild and manageable."*

Emetics have also been strongly recommended in some varieties of erysipelas. In the bilious erysipelas, which Desault regards as the common and genuine form of this disease, he trusted entirely to antimonial emetics. *Renauldin*, author of the article *Erysipèle*, in the *Dictionaire des Sciénces Médicales*, also adds his testimony in favour of the use of emetics in this affection. In general, however, emetics are improper in cases attended with dryness of the skin, much thirst, great heat of the epigastrium, and a high grade of fever. (Cazenave.) In cases attended with bitterness of the mouth, a yellow fur on the tongue, nausea, and a moderate temperature of the skin, they may generally be employed with considerable advantage.

In the first stages of measles and small-pox, attended with strong internal congestions, the operation of an emetic often proves decidedly beneficial. "In the beginning of measles," says Dr. Armstrong, "when the lungs have been exceedingly oppressed, and particularly when vomiting has been absent, I have often seen the most striking relief follow an antimonial emetic, which may fairly be ranked among the most efficacious remedies in pulmonic congestions."† They are par-

* Armstrong on Scarlet Fever, p. 35.

† Practical Observations on Scarlet Fever, Measles, and Pulmonary Consumption, p. 130.

ticularly useful in cases where, from great internal venous congestions, the appearance of the rash is retarded. In cases of this kind—that is, where the temperature of the skin is moderate, the pulse weak, and the animal functions depressed, about the period when the irruption of the exanthema may be expected, the operation of an emetic will often speedily develope the arterial excitement, and bring the measly rash.

Emetics constitute an important auxiliary in the treatment of many of the phlegmasiæ. In puerperal fever they were at one time in high repute. Where there is nausea and bilious vomiting in the beginning of the disease, one or two gentle emetics may sometimes be employed with advantage. They cannot, however, under any circumstances, be relied on as a principal remedy in this dangerous affection, and may, I think, be always omitted with propriety, except in the very commencement of the disease, and where the indications for their employment just mentioned are present.

In the treatment of croup, emetics are of unquestionable advantage. They are, indeed, altogether indispensable in managing this formidable malady, and will often procure effectual relief without any other remedy. In slight attacks, vomits, assisted by the warm pediluvium, and the application of rubefacients to the throat, often suffice to put a speedy termination to the disease. But where the febrile symptoms run high, and the breathing is very difficult, bleeding is our sheet anchor. Whenever, therefore, vomiting and the warm bath do not afford effectual and speedy relief, immediate recourse ought to be had to the lancet. The bleeding should be carried to the extent of producing a decided impression on the system. "In all the cases of

croup," says Dr. Ferriar, "which I have seen, I have found it necessary to bleed immediately, and when I have seen the patients sufficiently early to entertain hopes of saving them, I have directed the evacuation to be continued, so as nearly to produce fainting. This is the essential point of the cure, without which no relief can be effected. Even if the patient should not be seen till the day succeeding the attack, it is proper to bleed *ad deliquium*, if the subject be plethoric, and the difficulty of breathing and restlessness be great."* Independent of the relaxation which a decisive bleeding produces in the glottis, and the favourable impression it makes on the tracheal inflammation, it has the effect also of greatly facilitating the operation of emetics, by removing the cerebral congestion, and consequent insensibility of the stomach to the action of remedies. The emetics should be continued at intervals until the disease is completely subdued. In the latter stages of the complaint, they are useful by promoting the discharge of the viscid mucus secreted in the bronchia.

In cynanche laryngea, undoubtedly the most fatal variety of anginose disease, vomits have been known to afford decided benefit. Dr. Armstrong recommends the employment of emetics in this fatal affection, as one of the most effectual means we possess of arresting its progress. He states, that in five cases of this disease, he exhibited "tartarized antimony, sometimes combined with ipecacuanha, in repeated doses, until free and frequent vomiting took place. No circumstance of my professional life," he continues, "ever gratified me more than the great and sudden relief which the vomiting afforded; in reality it removed all

* Ferriar's Medical Histories and Reflections, p. 137. Philadelphia edition, 1816.

the urgent symptoms at the time, and being excited as soon as ever the slightest signs of stricture in the larynx returned, at last completed the recovery."*

Emetics may be very beneficially employed in the treatment of peripneumonia notha. Where the inflammatory condition has been in some degree subdued, or where the stage of excitement has never developed itself fully from internal venous congestions, emetics, in repeated but gentle doses, are among our most efficient remedies. Large quantities of viscid phlegm are usually thrown up, and in many instances immediate relief is obtained. After the operation of the emetic, suitable stimulants, such as small doses of opium and camphor, with some gentle diaphoretic drinks, should be given.† Of course, blisters to the chest are never to be neglected. They are indispensable to relieve the local pulmonary affection.

Emetics are no less useful in the treatment of pneumonia biliosa, than in the preceding variety of pulmonic inflammation. *Richter*‡ says, that they will often remove the excruciating pain in the thorax, as by enchantment. *Stoll*§ also speaks in the highest terms of the utility of emetics in this form of pleurisy. Professor Potter, of Baltimore, in an interesting paper published in the Medical Recorder, adds his testimony in favour of this practice. "Experience has taught us," says he, "that they (emetics) are eminently useful after the violence of inflammatory action shall have been abated, as well as in all the milder degrees with which this disease so frequently commences."‖ Since the

* Armstrong's Practical Illustrations on Typhus Fever. First American edition, p. 336.

† Richter's Specielle Therapie, vol. i. p. 427.

‡ Ibid. vol. i. p. 404.

§ Ratio Medend. vol. i.

‖ American Medical Recorder, vol. iv. p. 418.

first edition of this work was published, I have met with cases of strongly marked bilious pneumonia; and in these emetics afforded unequivocal benefit.

In the treatment of some varieties of acute ophthalmia, vomits have been recommended as particularly serviceable.

Many respectable writers have spoken very favourably of the powers of emetics in the cure of acute rheumatism. Horn* states, that in his hands emetics were more useful in this disease than any other remedy. He repeated them every day, until from fifteen to twenty were taken. The result of this practice, he informs us, was exceedingly happy. There is a form of rheumatism, which occurs in low and marshy situations, and which Richter calls *rheumatismus acutus gastricus*, depending, according to Stoll, on an irritation from vitiated or redundant bile in the primæ viæ.† In this form of the disease emetics are generally decidedly beneficial. Lentin‡ speaks of rheumatism connected with a bilious form of fever, in which vomits produced very beneficial effects. Scudamore, also, speaks favourably of the employment of vomits in this disease. "If the patient be seized," says he, "in consequence of exposure, shortly after some convivial occasion, on which he has indulged in improper diet, the present remedy should not, on any account, be neglected."§ I have occasionally met with cases of acute rheumatism, attended with manifest bilious symptoms, and in these I have employed emetics with advantage. In the purely inflammatory form of this disease, modified by

* Uber die heils. wirk. der Brechmittel in hitzigen rheumat D. Archiv. b. viii. st. 2.

† Ratio Med. tom. ii. p. 25.

‡ De aere et morb. clausthal. p. 30.

§ A Treatise on the Nature and Cure of Gout and Rheumatism, p. 298.

marsh miasmata, I have, however, never resorted to emetics, and can, therefore, say nothing from my own experience of their value in such cases.

Emetics have also been strongly recommended in gout. Scudamore thinks that they should not be used, "unless an evacuation of the stomach in a full degree is obviously indicated." He mentions a case, however, in which the good effects of an emetic were strongly exemplified. Mr. Alexander Small, surgeon at Minorca, speaks very favourably of the efficacy of tart. antim. in his own case of gout. He sometimes gave it with bark, in which combination it acted as a mild aperient.*

Mr. Saunders† was in the habit of employing tartarized antimony so as to excite nausea, or full vomiting, in acute opthalmia, with great success. In that variety of inflammation of the eyes, called Egyptian opthalmia, Sir W. Adams speaks of the use of emetics in the strongest terms of praise.

In gutta serena, also, emetics have been administered with very considerable advantage. Richter, who considered the cause of this disease as seated in the abdominal viscera, employed them much in conjunction with the deobstruent pills which will be hereafter mentioned, under the head of antispasmodics.‡

Of the propriety of employing emetics in hæmoptysis, I have great doubts, although very respectable testimony in favour of this practice may be adduced. When we attend to what takes place during the operation of an emetic, it is difficult, I apprehend, to enter

* Observations on the Gout, by A. Small, late surgeon to the ordnance in the island of Minorca, in the Med. Observ. and Inquiries, vol. vi. p. 198.

† A Treatise on some Practical Points relating to Diseases of the Eye, by I. C. Saunders.

‡ Richter's Medical and Surgical Observations, p. 254.

upon the employment of vomits for the cure of this variety of hæmorrhage, as recommended by Dr. Bryan Robinson, without considerable fears as to the result. During the process of vomiting there is a strong impulse given to the circulation; a full inspiration is made, by which the lungs become expanded, and a greater facility given to the escape of blood from the bleeding orifice.* Besides these effects, there is undoubtedly some impediment created to the passage of the blood through the abdominal aorta, in consequence of the action of the abdominal muscles and diaphragm; and of course there will be a greater impetus given to the blood through the superior arteries. It is true, that both before and after the act of vomiting, a very considerable languor in the circulation occurs, which might favour the suppression of the hæmorrhage; and if these remedies be exhibited only to the extent of inducing nausea, there can be no doubt of their being, in some degree, advantageous. The agitation and straining, however, during the efforts of vomiting, are calculated to produce much more mischief than could be compensated by any advantage to be derived from the subsequent languor. Cullen, indeed, who tried this practice, states, that in one instance it increased the hæmorrhage to a great and alarming degree.

In hæmorrhages from the uterus, there are, I think, much better grounds for expecting useful effects from the operation of this class of remedies.

Independent of every respectable testimony in favour of the use of emetics in this variety of hæmorrhage, we have a good anatomical reason, both for the advantages of vomits in menorrhagia, and for their occasional injurious effect in hæmoptysis. During the act of vomit-

* An Essay on the Materia Med. by J. Moore, p. 320.

ing, the abdominal muscles and diaphragm are thrown into a state of violent contraction. The natural consequence of this is a degree of pressure on the abdominal aorta, both where it passes through the crura of the diaphragm, by the contraction of this muscle, and in its course through the abdomen, by being compressed in common with the other contents of this cavity. Hence there will be a slight impediment to the passage of the blood to the lower portions of the body, whilst it will be more forcibly driven into the vessels which pass off from the aorta within the thorax. The reason is, therefore, obvious why vomiting will sometimes not only increase, but give rise to an hæmorrhage from the lungs; whilst, on the contrary, its effects in menorrhagiæ, so far as experience has taught us, are not only free from dangerous consequences, but are very often of unquestionable service.

The only case in which I have had recourse to this practice, was recently, in a delicate female, who, with menorrhagia, suffered under symptoms indicating the use of a gentle emetic. I ordered her eighteen grains of ipecacuanha, which brought on several copious bilious discharges from the stomach; and had the effect, besides, of giving a very decided check to the hæmorrhage.

Emetics have, also, been particularly recommended for the cure of hæmatemesis. Dr. Sheridan states, that, in a considerable number of instances of this variety of hæmorrhage, he has obtained decided benefit from emetics; and Dr. Chapman has resorted to this practice with unequivocal advantage.

In the treatment of dysentery, emetics are often of very great advantage. Where there is a redundancy of vitiated bile present in the primæ viæ, as is frequently

the case in the dysenteries of hot climates and marshy districts, vomits would seem to be indispensable. Sir John Pringle speaks very favourably of this practice; and Mr. T. Clark assures us, that he derived the greatest advantage from the employment of emetics in this disease, when administered in the form of enemata.* Cleghorn, too, gives his testimony in favour of emetics in this disease.† In cases unattended with high febrile excitement, I have sometimes given an ipecacuanha puke, when first called to the patient, and I believe always with advantage. It is evident, however, that where there is much fever, emetics should not be used until the arterial excitement is adequately reduced by direct depletory measures. In the treatment of diarrhœa, also, this class of remedies will often prove very serviceable. In this and the former intestinal disease, vomits are useful, not so much by evacuating the contents of the stomach, as by their tendency to equalize the circulation, and to determine it to the surface.

In that species of mania which arises from the intemperate use of ardent spirits, emetics are sometimes decidedly efficacious. This practice was introduced a few years ago, by Dr. Joseph Clapp, of this city, who has published the result‡ of his very extensive experience on this subject, exhibiting strong evidence of the utility of emetics in this very singular variety of mania. The late Dr. Albers, of Bremen, in a letter written a short time before his death, gave me an account of three cases of this disease, in which emetics were employed with evident advantage. The result was such at least,

* Observations on the Nature and Cure of the Diseases of the East and West Indies.

† Cleghorn's Observat. on the Epidem. of Minorca, p. 146.

‡ Vide Eclect. Repertory, vol. vii. p. 251. Also American Medical Recorder, vol. ii. and iii.

as to induce him to express a determination to adopt a similar treatment in future.

The stomach, in this disease, is often extremely insensible to the operation of emetics. It is, therefore, in general, necessary to employ very large doses before vomiting can be excited. Where full emesis is produced, the mental hallucinations are commonly much corrected, and in mild cases, sometimes entirely suspended, by a single emetic. It will most frequently be necessary, however, to repeat the emetic two, three, four, or even five or six times, at such intervals as the particular circumstances of the case may require. In the course of this treatment, the bowels must be kept relaxed by aperients, if the emetics do not produce this effect. Dr. Klapp does not think it necessary or even proper, to employ opium along with the emetic treatment, unless extreme exhaustion or hypercatharsis be induced by the emetic.

Emetics have also been much recommended in other varieties of mania, and in hypochondriasis. In the latter complaint I have employed them with evident advantage. An emetic will often rouse the hypochondriac patient from that state of mental and physical torpor with which he is pressed down, and render his system more sensible to the operation of other remedies. Emetics are particularly advantageous in this disease, when alternated with alterative doses of blue pill, and an occasional saline purgative. Whatever be our notions concerning the pathology of hypochondriasis, observation has fully demonstrated the intimate connexion of its symptoms with the particular condition of the abdominal viscera. In this disease there generally exists much congestion in the portal vessels, with torpor and functional derangement of the liver. By the

employment of these remedies, therefore, we not only evacuate the alimentary canal of its vitiated contents, but also invigorate the circulation in the portal system, both by the mechanical agitation of the vomiting, and the specific influence of the mercury upon the vascular extremities of the hepatic system. In a case of puerperal mania, I derived the most decided benefit from the employment of emetics. The patient had been delivered of her first child four days, when she began to manifest symptoms of mental derangement. She would neither speak nor take nourishment, unless greatly urged. After using a variety of means to induce her to speak, she replied that she was talking to good spirits from the other world, and was determined to have nothing to do with the beings of this wicked place. She declared she was perfectly well, and stood in no need of any medicines. In this state she continued for three days, and then, all at once, became extremely loquacious. Her pulse was small and frequent, and the pupils of her eyes much contracted. Under these circumstances, I ordered her an antimonial emetic, which brought on pretty copious vomiting. She became evidently much tranquillized by its operation, and seemed, at short intervals, to be sensible of her real situation. On the evening after the vomiting, I gave her an anodyne draught, which, however, did not procure her the rest I anticipated. On the next day I gave her another emetic, which again operated well; and from this period she rapidly recovered the full possession of her mental faculties.

In hysteria, also, emetics are often of unequivocal advantage. They are, perhaps, to be employed usefully in every variety of the disease; but in that form which is attended with complete suspension of the animal

functions, or a state resembling syncope, I have found them to be particularly useful.* Dr. Dean, a highly respectable practitioner in the interior of this state, adds his testimony in favour of the employment of emetics in hysteric affections. His experience has led him to regard them as decidedly the most effectual remedy we possess in the chronic form of this disease. "It is in the chronic variety of this complaint," says Dr. Dean, "in which the common routine of what are improperly termed antispasmodic medicines, produce no other than transient relief to the patient, that I have experienced the most permanent good effects from the administration of emetics. In cases of this description, where the patients had laboured under this disease for ten years, and during that time, by the advice and direction of respectable physicians, exhausted, with at most but temporary benefit, the whole class of remedies which are usually prescribed, I have, by the continued exhibition of vomits, either entirely removed the complaint, or so far interrupted the habits of diseased action in the stomach, that antispasmodic and tonic medicines would, in general, complete the cure."† Dr. Joseph Smith, of New York, has published some interesting observations on the employment of emetics in spasmodic diseases. "The experience I have had," says he, "of the utility of emetics in *hysteria* and epilepsy, enables me to assert, with confidence, that they are more efficacious than any remedy ordinarily employed."‡

In asthma emetics are sometimes highly useful. They not only assist materially in expelling the viscid mucus from the bronchia, but operate in a direct manner in

* American Medical Recorder, vol. iv. p. 124.

† Ibid. p. 259.

‡ Transactions of the New York Physico-Medical Society, vol. i.

facilitating the transmission of the blood from the right to the left side of the heart, the impeded course of which forms, perhaps, the chief source of distress in this and other similar affections. That the operation of an emetic produces this effect, is evident from the circumstances which take place during the act of vomiting. During this process, the diaphragm is drawn downwards, by which the thoracic cavity is enlarged, and the lungs are in a full state of inspiration, and therefore expanded to the utmost degree. The necessary consequence of this is, that the blood which had congested in the pulmonary arteries, right side of the heart, and large venous trunks, in consequence of the previous inadequate expansion of the lungs, is now, during the act of vomiting, permitted to pass on with freedom to the right side of the heart. And hence, in part, the temporary relief almost invariably obtained from full vomiting in this disease.

In the treatment of hooping-cough, also, emetics, in general, afford very considerable relief. Where the disease is attended with much arterial excitement, they are, however, inadequate of themselves to do much good, and should be assisted by prompt and decisive venesection.

Much dispute existed at one time concerning the propriety of administering emetics in apoplexy. This subject is amply and warmly discussed in the fifth and sixth volumes of the London Medical and Physical Journal. As the tendency of vomiting to propel the blood to the superior parts of the body, from the causes which I have already mentioned in this chapter, is very considerable, I am entirely convinced that, in general, this class of remedies cannot be safely employed in apoplexy. This disease may, however, occur under

circumstances of gastric irritation, which will not only render the employment of an emetic useful, but absolutely indispensable. When, for instance, apoplexy comes on immediately after eating a full meal, it would be exceedingly unwise to suffer the stomach to remain oppressed and over-distended by what had been eaten. But even under such circumstances, a copious abstraction of blood should always be premised, for the apoplectic symptoms may as yet depend simply on turgescence of the vessels of the brain, which from the further impetus given to the blood by the efforts of vomiting, may become ruptured, and bring on fatal extravasation. The occurrence of this event will be rendered much less probable, if we lessen, to a considerable degree, the general mass of the blood previous to administering the emetic. Where there is no strong reason to suspect irritation in the stomach, either from over-distention or from the presence of some irritating substance, I cannot conceive what advantage could result from the administration of an emetic. If apoplexy be essentially connected with engorgement of the cerebral vessels, it is obviously wrong to resort to a treatment which has a direct tendency to increase the fulness of these vessels.

Of the effects of emetics in epilepsy, the records of medicine furnish us with very contradictory evidence. As in the treatment of apoplexy, so in that of epilepsy, their employment has been on the one hand as extravagantly praised, as it has been inordinately censured on the other. It may be observed that, perhaps, in all cases where we have contradictory evidence, from respectable sources, in relation to the remediate powers of a remedy, it arises from its having been given either in different stages of the same complaint, or in different

varieties dependent on a difference in the remote causes. We may, therefore, safely conclude, that although as a general rule, emetics may not be proper in epilepsy, yet occasionally this disease may present itself under circumstances which will render them decidedly beneficial.

In the epilepsy of children, when there does not appear to be much fulness of the vessels of the head, and symptoms of gastric irritation are present, such as nausea, flatulency, disturbed sleep, and other marks of indigestion, emetics are sometimes of essential importance. Dr. J. Clark advises, for this purpose, a solution of the sulphate of zinc in an aqueous infusion of ipecacuanha, to be repeated in six, eight, or ten days, according to circumstances. Dr. Thomas says, that when an attack of idiopathic epilepsy can be foreseen, there is, perhaps, no remedy which will be more likely to prevent the paroxysm, than an emetic administered about an hour before its accession. In a child, which had been about eighteen months affected with occasional epileptic convulsions, I succeeded in removing the disease entirely, by a long course of emetic remedies, administered every third day. The disease came on after an attack of ague, which was cured by arsenic, and was probably at last kept up from habit. I employed ipecacuanha.

Of the utility of emetics in the early stages of indigestion there can be no doubt. In the advanced periods of the complaint, however, when the disease no longer consists, simply, in *functional* derangement of the stomach, but has degenerated into chronic inflammatory irritation of its mucous membrane, they are decidedly improper. In recent attacks of indigestion, attended with distressing pains of the stomach, or

symptoms of an oppressed state of the brain, an emetic will often procure the most prompt relief. In persons whose digestive organs are much debilitated, food, which in the healthy state of the stomach is perfectly innocent and nutritious, will sometimes produce "great general distress, numbness of the scalp, violent colic, acute pain in the side and bladder, vertigo, apoplexy, and convulsions." In affections of this kind, emetics are obviously the proper remedies; Dr. Revere, of Baltimore, relates several cases in which their efficacy was promptly and conspicuously manifested.*

But although an occasional vomit may be useful or even indispensable, in obviating the ordinary symptoms of indigestion, yet experience has shown the propriety of employing them with caution; and only when evident symptoms of gastric impurities are present.

In dropsical diseases emetics have been much employed. They have been prescribed in every variety of dropsy, but they appear to be more particularly applicable to the treatment of *anasarca* and *ascites*.

Emetics have also been recommended in diabetes. Richter relates several cases that were effectually cured by them. Where this disease is evidently connected with gastric irritation, as in the cases mentioned by Richter, vomits will, no doubt, do much good. This writer mentions an instance of this disease, where an emetic brought up a very great quantity of bilious matter; "and I can assert with truth," says he, "that next morning there was not a vestige of diabetes or of any other complaint present."† We have also the testimony of Frank, in favour of the employment of this class of remedies in the present disease. Emetics are,

* American Medical Recorder, vol. iv. p. 50.

† Medical and Surgical Observations, p. 84.

indeed, a very common remedy in the treatment of diabetes with the German physicians; and many cases may be found in their writings illustrative of their beneficial effects.

In the treatment of jaundice, emetics are often of essential service. They are particularly calculated to promote the passage of gall-stones through the common duct. By the nausea they create, they relax the duct, whilst the mechanical pressure and agitation caused by vomiting tend to push the calculus forward in the relaxed tube.

Emetics often act very beneficially in hernia humoralis. I have, in several instances, witnessed the good effects of strong antimonial vomits in reducing these painful swellings. Emetics have also been a good deal recommended to reduce indolent buboes; but their effects in this way do not appear to be considerable.

For obstinate constipation, emetics have been very highly recommended. The Greek and Roman physicians appear to have frequently resorted to this practice. It is recommended by Hippocrates,* Praxagoras,† Cœlius Aurelianus,‡ Alexander Trallianus;§ and among the moderns, by Stoll,‖ Sims,¶ Sumeire,** and Deplace.†† Quite recently Professor Hosack has published his experience upon this subject. He details seven cases of this kind, from which it appears, "that in the commencement of constipation, or in its more

* Περὶ Νουσων, III. v. Opp. p. 491.
† Apud. Cœl. Aurel. p. 243.
‡ Ibid. p. 529—532.
§ L. iii. C. 44.
‖ Rat. Med. P. ii. p. 135—138.
¶ Observations, p. 20, et seq.
** Journal de Médécine, T. LXI. p. 369.
†† Ledellot. Jour. T. XXXVI.

advanced stage, when the symptoms of inflammation have been subdued by the lancet, emetics may be very advantageously exhibited, both for the purpose of removing the hepatic obstructions, and of counteracting the spasmodic constriction and pain ordinarily attendant upon this disease."*

CEPHÆLIS IPECACUANHA.

(*Ipecacuanhæ Radix.*)

This plant—a native of South America—was first discovered about the middle of the seventeenth century. Its botanical character remained for a long time unknown. It was, at first, thought to be a species of viola—the *viola ipecacuanha* of Linnæus. That celebrated botanist afterwards obtained some specimens of a plant from Mutis, which, it was thought, afforded the genuine ipecacuanha. This plant he described under the name of *poycotria emetica*, and it was, accordingly, for some time, generally regarded as the true ipecacuanha. More careful observations, however, discovered that neither of these two plants was the one which afforded the genuine root. It was not until the year 1801 that the actual plant which yields the ipecacuanha was described. Dr. Gomez, of Lisbon, was the first who gave an accurate description and figure of it; and in the following year, M. Brotero, Professor of Botany at the University of Coimbra, published a full account of it under the name of *callicocca ipecacuanha*. But as "the term *callicocca* had been applied by Schreber, without sufficient reason, to a genus previously established and

* New York Medical and Physical Journal, vol. i. No. 1, p. 60.

named, it has, of late years, been universally abandoned for the *cephælis* of Swartz."

There can be no doubt, however, that the ipecacuanha of commerce often consists of different roots, possessing emetic properties, and bearing a general resemblance to each other. Decandolle asserts that the ipecacuanha, as it is found in the shops, is frequently a mixture of the genuine root with the roots of some species of violets, opocynæ, euphorbia, &c.; and appears, moreover, to be occasionally mixed with the roots of some species of the genus *Ionidum*.* To what degree these adulterations may deteriorate the value of the ipecacuanha, I am unable to say. It is certain, however, that they must interfere with its peculiar virtues, and tend more or less to modify and render uncertain its effects.

The genuine ipecacuanha is in irregularly bent or contorted pieces, about the thickness of a goose-quill, consisting of an internal firm ligneous portion, of a light straw colour, and a thick layer of cortical substance, presenting on its surface numerous annular ridges, or prominent rings, separated by deep and narrow fissures. The external, or cortical portion, is a compact horny structure, slightly diaphanous, breaking with a resinous fracture, and easily separated from the internal ligneous cord. The epidermis, or external surface of the root, varies considerably in colour. In some specimens it is of a deep brown or blackish colour; other specimens present a reddish-brown, or reddish-gray surface, and we sometimes find it gray, or ash-coloured. The diversity of colour does not indicate any essential difference in the roots, or in their medicinal or chemical properties, and depends, probably, "on difference in age,

* Nouveaux Elemens de Therapeutique, par I. L. Alibert, t. i.

or place of growth, or mode of drying." The internal woody part is nearly inert, the peculiar medicinal virtues of the root residing almost wholly in the external cortical substance. The colour of the powder is of a light grayish fawn. In its aggregate state, the root has but very little smell, but when pulverized, it emits a peculiar nauseous odour, which, in some individuals, causes extremely unpleasant effects, such as giddiness, fainting, asthma, &c. Its taste is bitter, acrid, and very nauseous.

Magendie and Pelletier have ascertained that ipecacuanha contains a peculiar principle, to which they have given the name of *emetin*,* and upon which the emetic properties of the root seem entirely to depend. This substance resides almost exclusively in the cortical part of the root.

When perfectly pure, it consists of a white pulverulent substance, possessing a slightly bitter, and somewhat nauseous taste, but little or no odour. It undergoes no change when exposed to the air; is very fusible, sparingly soluble in cold water and ether, but readily dissolved by alcohol. It unites with the mineral acids, and with acetic acid, and forms crystallizable salts. Gallic acid precipitates it from its solutions;

* The following is the formula introduced into the new codex of Paris, for the preparation of this substance:—"Let ℥i. of the powder of ipecacuanha be macerated in ℥ii. of ether, with a gentle heat, for some hours, in a distilling apparatus; let the portion which remains be triturated and boiled with ℥iv. of alcohol, it having been previously macerated in it; filter, and let the remainder be treated with fresh portions of alcohol, as long as any thing is taken up from the root; mix these alcoholic solutions and evaporate to dryness; let this alcohol extract be macerated in cold distilled water, in order that every thing soluble in that menstruum may be dissolved; filter, and evaporate to dryness; this extract is *emetin;* in this state, however, it contains a small quantity of *gallic acid*, but which is too inconsiderable to affect its medicinal qualities."—*Paris's Pharmacologia.*

"it is very difficult, however, to procure it in a state of entire purity;" and as it is obtained in the shops it is always very impure. *Impure* emetin consists of minute transparent scales, of a brownish red colour, possessing very little odour, and a taste resembling that of the powdered ipecacuanha. It is rapidly dissolved by water, acetic acid, and alcohol, but insoluble in ether. It deliquesces in moist air, and is precipitated from its solutions, by gallic acid, the acetates of lead, and corrosive sublimate, but tartarized antimony has no effect on it. According to the analysis of Pelletier, ipecacuanha contains sixteen parts of emetin, two of oil, six of wax, ten of gum, forty of starch, and twenty of woody fibre.

Of a hundred parts of ipecacuanha, alcohol takes up about twenty-one; proof spirits somewhat more than thirty-two; and boiling water nearly forty-seven.

This substance is, undoubtedly, the most important vegetable emetic we possess, and in many instances preferable to every other article belonging to this class. It is mild in its operation, and may be safely exhibited under circumstances of general exhaustion, or intestinal irritation, which would render the employment of antimonial emetics injurious. In all cases where the stomach is irritable or debilitated, the ipecacuanha is decidedly the best emetic. It seems to have less tendency to weaken the digestive powers of the stomach than any other article of this class; it would appear even to exert some tonic power upon this organ, when given in very minute doses, as I have more than once observed in my own person, and it unites, moreover, to its emetic virtues, no inconsiderable powers as an antispasmodic, as well as a tendency to allay nervous irritation. It possesses another advantage over antimonial

emetics, which in many cases is of great importance; it is much less apt to act upon the bowels, and to pass off by copious and exhausting stools, than the preparations of antimony. This is of immense consequence in many diseases; for we often find it useful to procure emesis, in cases where a rapid catharsis would prove highly injurious. It is, nevertheless, not destitute of properties capable of exciting the peristaltic action of the intestines. It will, in general, after having acted upon the stomach, prove gently aperient, and excite, moreover, in a very particular manner, the cutaneous exhalents;—circumstances which render it peculiarly adapted to the treatment of several intestinal diseases.

Its power as an antidysenteric, was indeed the very first circumstance which brought this remedy into notice. Pison, as early as 1649, mentioned the ipecacuanha as a common remedy for dysentery in the Brazils. It was not, however, until the year 1672 that it became known in Europe. When first imported into France, it was, for some years, employed as a secret remedy, by John Helvetius, grandfather of the celebrated metaphysical author of that name. His success, with this remedy, in the treatment of dysentery and diarrhœa, was so great as to attract general attention, and induce Louis XIV. to grant him a large sum of money, besides public honours, for making the remedy public. Although this article has not maintained its former reputation as a remedy in dysenteric affections, it is, nevertheless, still regarded, and justly, too, as a medicine of much value in complaints of this kind. It is given in dysentery, with a view either to its emetic or sudorific operation, though the latter is, in general, the principal intention for which it is employed. On this account, therefore, it is commonly given in combi-

nation with other substances calculated to increase its tendency to excite the cutaneous emunctories. Besides these obvious effects on the system, ipecacuanha appears, moreover, to possess the power of tranquilizing the actions of the alimentary canal, *when administered in minute doses.* I have, in many instances, known chronic vomiting and diarrhœa arrested by repeated doses of minute portions of this article, although no perceptible evacuent effect attended its operation.

Moseley, who adopted the sudorific plan of treating this disease, gave small doses of ipecacuanha in combination with opium. There can be no doubt that this treatment may sometimes cure dysentery, but the experience of the profession would seem to show that it cannot be safely relied on as a principal part of the treatment of such cases. In the dysenteries of this country, at least, more promptly evacuant measures are necessary, and if ipecacuanha be used in the early stage, it should, perhaps, always be given, in the first place, to the extent of inducing full vomiting. Sir John Pringle was in the habit of giving it in small doses, and repeating it until both vomiting and purging were produced. To insure its operation on the bowels, Cleghorn gave it in union with the *cerated glass of antimony*, in such doses as to produce a full emeto-cathartic effect.

In the latter stages of the complaint, however, when the arterial excitement has been considerably subdued, there is no remedy which is so well calculated to mitigate at once the distressing tormina, and to keep up an agreeable and salutary moisture of the surface, as ipecacuanha and opium combined. If calomel be united with these two articles, we heighten, still more, the curative effects of the composition; for, in connection

with the torpor of the cutaneous exhalents, the functions of the liver are always more or less deranged in this malady.

Mr. Playfair, in a paper published in the tenth volume of the Edinburgh Medical and Surgical Journal, has given an account of a new mode of using ipecacuanha in this disease; and which he states to have proved exceedingly successful. He gave from half a drachm to a drachm of the article, in union with from thirty to sixty drops of laudanum, keeping the patient for some time after in a horizontal position. When the medicine was rejected, he repeated the dose. He states that this practice is applicable only to the early stage of the disease. He practised in Bengal. The ipecacuanha has also been administered in the form of an enéma, in dysentery; and its effects, when thus employed, have been much praised.* For this purpose, three drachms of the bruised root are to be boiled in a quart of water down to a pint, and administered, all at once, as an enema. This injection is also greatly extolled for the relief it affords in internal piles. In several cases of this kind, I have, myself, had an opportunity of witnessing its good effects.

Ipecacuanha, given in small doses, so as to puke gently, has been much praised for its effects in the cure of diarrhœa, and more particularly if the disease be attended with symptoms of gastric impurities. Dr. Samuel Pye has published a number of cases illustrative of the good effects of ipecacuanha in this disease. He administered it in small doses, sufficient, however, to produce vomiting, and repeated the medicine from day to day, with an occasional anodyne mixture, until

* Observations on Fevers and other Diseases of the Indies. By Thomas Clark. London, 1801.

the disease disappeared.* The same practice is recommended, for the cure of diarrhœa, by Dr. Fothergill, and my own experience enables me to speak with much confidence of the usefulness of the practice, in cases of this kind.

Much has been said of the efficacy of nauseating doses of ipecacuanha in hæmorrhages. Dr. A. N. Aasheim, a Danish physician, has published some interesting observations on the employment of this remedy in hæmoptysis. He gave one-fourth of a grain every three hours during the day, and every four hours during the night. The third dose, in general, excited slight vomiting. By this treatment, Aasheim remarks, the bleeding was put a stop to; the cough became less severe, and the skin, which before was dry, was rendered moist, and soft to the feel.† Richter observes, that when hæmoptysis is attended with cold extremities, anxiety, restlessness, pale urine, and a small, tense and quick pulse, great advantage may, in general, be derived from quarter of a grain doses of ipecacuanha, repeated every fifteen minutes;‡ and Meza asserts, that under circumstances of this kind, it is the most effectual of all remedies when given in this way.§ The good effects of this article in hæmorrhage, depend, no doubt, on the restraint which it exercises over the action of the heart and arteries, by the nausea it creates, and still more, perhaps, on its power of equalizing the circulation and exciting the cutaneous emunctories. In uterine hæmorrhage, this article has been found still more beneficial than in the other hæmorrhages, and this may, perhaps, be accounted for in the way I have already

* Medical Observations and Inquiries, vol. i. p. 2.

† Alibert Mat. Med. tom. i. p. 248.

‡ Speciell Therapie.

§ Samml. Auserles. Abhand. Bd. 15. p. 259.

attempted to do, when speaking of the general application of this class of remedies to the cure of diseases. It was first particularly recommended as a remedy in menorrhagia, by Dahlberg;* and its efficacy was afterwards confirmed by Plink, Loeffler, and others. Bergius relates a violent case of uterine hæmorrhage, which he cured by giving half a grain of this remedy every half hour. I have never used the ipecacuanha in cases of this kind, but I can well conceive of the propriety of the practice.

Ipecacuanha vomits have been thought peculiarly serviceable in asthma. Bang, Percival and Joerdens mention its use in this affection with particular commendation. Vomiting, by whatever article excited, must of itself, simply from its mechanical operation, be useful in the asthmatic paroxysm. By the contraction of the diaphragm, it augments the cavity of the thorax, and allows the lungs to expand more fully, by which the transmission of blood through those organs is greatly facilitated, and a principal source of uneasiness in this disease temporarily removed. Besides this effect, it aids, in no inconsiderable degree, to expel the viscid mucus from the bronchia, and thereby gives a greater opportunity for the oxygenation of the blood. But independent of these general effects, ipecacuanha has been supposed to possess antispasmodic or other peculiar powers calculated to act beneficially in this disease. It may be doubted, however, whether, in this respect, it possesses any advantages over other emetics, except in its acting more mildly, and not being apt, like the antimonial preparations, to pass off rapidly by the bowels, and debilitate the digestive organs. It must be observed, however, that Akenside, who published a

* Specielle Arzneimittellehre. Von G. A. Richter. Berlin, 1827.

paper on the use of this article, in the present disease,* states, that he found it equally useful, whether given to the extent of producing vomiting, or only in nauseating doses. In the *paroxysm* he administered it so as to produce vomiting, but after the paroxysm had passed off, he continued its use every morning in nauseating portions.

In the Memoirs of the Medical Society of Copenhagen, there are some very interesting remarks on the employment of ipecacuanha as an *anti-emetic*, by Dr. Schonheyder. He relates the history of a case of *ileus*, in which small doses of this article proved successful, after every other means of relief had been fruitlessly employed. In this case the stomach was extremely irritable, and fecal matter was thrown up, very frequently, for several days. The thirst was extremely urgent; the abdomen, however, was neither hard, nor tumid, nor painful. Small doses of ipecacuanha were finally given. The second dose removed the disposition to vomit; and by continuing the medicine, the disease was entirely subdued.† Burdach also states, that it is very useful in habitual vomiting from morbid irritability of the stomach. In such cases, however, it must be given in very small doses.

Of the efficacy of minute doses of ipecacuanha, in cases of this kind, I have recently had an interesting exemplification. An hospital patient, who had for three weeks laboured under such extreme irritability of the stomach, that almost every thing he took into his stomach was speedily rejected, after a great variety of means had been resorted to, without any decided advantage, was, in a short time, entirely relieved by quarter-grain doses of ipecacuanha every half hour.

* Memoirs of the London College of Physicians.

† Alibert Matière Médicale, t. i. p. 249.

Alibert mentions, on the authority of J. W. Guldbrand, a Swedish physician, that ipecacuanha has been found to manifest important emmenagogue powers. He refers to two obstinate cases of amenorrhœa effectually cured by it.

Ipecacuanha has also been applied to the cure of indigestion. Daubenton gave it in doses just sufficient "to excite a slight sensation of vermicular motion of the stomach, without carrying it to the point of nausea."* I have used it in my own case, in doses of one-fourth of a grain every morning, noon, and evening, with evident advantage. Hufeland recommends the use of one-fourth of a grain every two hours, in cases of indigestion, attended with much flatulence, tension, and fulness in the epigastrium, together with constipation and a sense of fulness in the head.†

With regard to the proper dose of this article, we should find it difficult to arrive at any definite conclusion, from a reference to authorities. Dr. Pye records upwards of one hundred and fifty cases, in all of which vomiting was produced effectually, and in by far the greatest majority repeatedly, by two, three, and four grain doses. Cullen expresses his doubts with regard to the correctness of this statement; but we have the testimony of Chaumenton and others in confirmation of the vomitive power of small doses. Those who are in the habit of prescribing the Dover's powder, or the more simple combination of ipecacuanha and opium, for diaphoretic purposes, know how apt they are to excite vomiting, although the quantity of ipecacuanha is but very small. It would appear, indeed, as if the opium which enters into these compositions, enhanced

* Alibert.

† Hufeland's Journal, Bd. 29. St. xi. p. 121.

the emetic properties of the ipecacuanha. The medium dose of powdered ipecacuanha, as an emetic, is about twenty grains; although much larger doses may be given without detriment, as the greater part of it is commonly thrown up by the first discharges. I am informed by Dr. Joseph Hartshorne, of this city, that the addition of powdered gum arabic destroys almost entirely the peculiar nauseous taste of ipecacuanha. The officinal preparations are the *pulvis ipecacuanhæ compositus*, and the *vinum ipecacuanha*. The powder becomes inert by long exposure to the air and light. All vegetable astringents, as *infusion of galls*, &c. *vegetable acids*, especially the *acetic*, weaken its power. Dr. Irvine found that gr. xxx. administered in ʒii. of vinegar, produced only some loose stools.

Emetin is a powerful preparation of ipecacuanha. One-sixth part of it is considered equivalent to about one part of the powdered root. It is apt to produce very active vomiting, but its tendency to create irritation of the mucous membrane of the stomach and bowels appears to be very considerable, and renders it altogether a much less useful medicine than the ipecacuanha in substance. Ten grains of this preparation were sufficient to destroy animals in twenty-four hours; and on dissection the mucous membrane of the whole tract of the alimentary canal, as well as the respiratory passages, exhibited marks of strong irritation. It is said also to manifest narcotic powers. When given so as to excite vomiting, it generally leaves the patient in a very drowsy disposition.

Formulæ.

℞.—Pulv. ipecac. gr. x.;
Pulv. opii gr. v.;
Calomel gr. v.;
Pulv. camph. gr. viii.—M. Divide into ten equal parts. One of

these taken every two or three hours, will often procure much relief in dysentery, after proper evacuations have been procured.

℞.—Pulv. nitrat. potas. ʒi.;
Calomel gr. vi.;
P. opii gr. iii.;
P. ipecac. gr. vi.—M. Divide into six equal parts. One to be taken every two hours. This combination is an excellent expectorant in pulmonary catarrh.

℞.—Pulv. ipecac. gr. viii.;
Massæ hydrarg. gr. xxiv.;
Pulv. capsici gr. vi.—M. Divide into six pills. One to be taken at night, as an alterative, in indigestion from mere debility of the stomach.

ANTIMONY.

Antimony is a hard and brittle metal, of a bluish white colour, resembling tin in its lustre. It is of a lamellated texture, and when handled imparts a peculiar smell to the fingers. It enters into fusion at a degree of heat a little above red, and when suffered to cool, presents a stellated appearance on the surface.

This substance was known to the ancients under the name of *stibium*, but was not employed as an internal remedy until about the middle of the sixteenth century. About this period Basil Valentinus published his *Currus Triumphalis*, in which we find various preparations of this metal mentioned, and their internal employment enthusiastically recommended.

Paracelsus became its warm advocate, and announced it as a powerful and efficacious remedy in plague. In the plague which ravaged Bohemia in 1562, antimony was extensively employed. But as its virtues were imperfectly understood, it was frequently administered improperly, and occasionally attended with violent and

dangerous consequences.* It was, therefore, soon denounced by the Medical Faculty of Paris as a fatal poison; in consequence of which the French parliament issued a severe decree against its internal employment in 1566. In 1603, the celebrated Theodore Turquet de Mayerne was prosecuted for having sold antimonial preparations, contrary to the decree of parliament; and Besnir, an eminent physician of that time, was expelled the Medical Faculty of Paris, for having employed this proscribed remedy. After this decree had been suffered to stand for more than half a century, it was at last repealed, and antimony soon became one of the most boasted and popular articles of the materia medica.

In pursuit of an universal remedy, the alchemists of the sixteenth and seventeenth centuries subjected this metal to an infinite variety of chemical processes, from which has resulted an astonishing number of preparations, differing, however, more in the degree than in the quality of their remedial powers.

The pure metallic antimony is entirely insoluble in water and alcohol. Vegetable acids act upon it, though but feebly; and hence cups of this metal were formerly employed to impart an emetic quality to wine.

Crude Antimony.—Sulphuret of Antimony.—The article met with in the shops under this name is a protosulphuret of the metal, and is obtained from the native sulphuret by different modes of purification. It consists of one equivalent of antimony, 44, and one equivalent of sulphur, 16-60. In this state of combination, antimony is at present but very rarely employed in medicine, and never as an emetic. As an alterative, however, it has been much praised by some writers of eminence; and it is not improbable that, in some cuta-

* Matthiol. Comment. in Dioscorid. lib. v. c. 59, p. 838.

neous, and other chronic disorders, its powers are too much neglected. In the Transactions of the Society of Copenhagen, Dr. J. W. Guldbrand has published a paper on the anti-arthritic virtues of crude antimony, and he declares it to be a most valuable remedy in chronic rheumatism. Quarin gave it in this disease, in combination with three parts of sulphur; and Stoll, who speaks highly of its employment in affections of this kind, recommends it to be used in union with myrrh. One of the general effects of antimonial remedies, when given in minute doses, appears to be, an excitation of the capillary vessels throughout the whole system, but more especially of those of the cutaneous surface. Such an operation has a direct tendency, not only to equalize the general circulation, and to remove congestions in the capillary system, but also to excite a new action in the extreme vessels of the skin, and consequently to relieve those disorders of the cutaneous surface which depend on deranged functions of its vessels. Antimony is, indeed, one of the most important remedies we possess, in the treatment of many of the diseases of the skin. In its crude state it has been much employed for this purpose, both by itself and in union with other substances, such as cicuta, guaiac, dulcamara, &c. It is, notwithstanding, confessedly inferior in this respect to the more active preparations of the metal. In the treatment of *plica polonica*, Lafontaine regards it as almost an invaluable remedy.*

In scrofulous affections the sulphuret of antimony is much extolled by some writers. It appears to be particularly applicable to cases that are attended with cutaneous eruptions, or ulcerations. Richter cured a case of scrofulous fistula lachrymalia by means of the

* Burdach's Mat. Med. vol. ii. p. 376.

internal employment of the sulphuret of antimony. Kotrum recommends it in union with equal portions of burned sponge, sulphur, cicuta and pulverized oyster-shell, as a valuable remedy for goitre.

This substance is given in finely levigated powder, in the dose of from ten to thirty grains. If it act as an emetic, in consequence of meeting with an acid in the stomach, it ought to be given in combination with an alkali or absorbent.

Antimonii Sulphuretum Præcipitatum.—This is a bright orange-coloured, slightly styptic, inodorous powder. It is composed of about thirty parts of sulphur, fifty-five of sub-oxide of antimony, and fifteen of sulphureted hydrogen. It is entirely insoluble in water. When exposed to heat, it readily enters into combustion, burning with a greenish-blue flame, giving off sulphureous acid vapour, and leaving the metal in the state of a gray oxide. Sulphuric acid does not act upon it when pure; if it effervesces with this acid, as is sometimes the case, we may presume that it is adulterated with chalk. In a state of purity, it dissolves readily in solutions of the caustic fixed alkalies.

This preparation is diaphoretic, cathartic, or emetic, according to the dose in which it is exhibited. In the cure of cutaneous diseases, this medicine was formerly more generally recommended than any other antimonial preparation. It has unquestionably considerable claims to attention in this respect, although upon the whole, perhaps, is less efficacious in these affections than the black sulphuret of antimony already noticed. In eruptions depending on a syphilitic taint, it may be very advantageously employed in combination with mercury. For this purpose I have been much in the habit of prescribing Plummer's

pill,* which is, indeed, a very useful remedy in almost every variety of chronic disease of the skin.

The precipitated sulphuret of antimony has been recommended as peculiarly serviceable in chronic rheumatism. In this disease it is given in union with camphor, opium, or gum guaiac.†

The dose of this preparation is from two to six grains, three or four times daily. It is to be gradually augmented until it excites slight nausea, and ought never to be given with acids or acidulous salts, if it be employed with a view to its alterative effects, as these substances have the power of very considerably increasing its emetic properties. Where there is reason to suspect the existence of an acid in the primæ viæ, it ought to be administered in union with soap, magnesia, or aromatic confection.‡

Kermes Mineral. Oxy-sulphuret of Antimony.—This preparation was formerly thought to consist of a combination of sulphuretted hydrogen and protoxide of antimony. According to Gay Lussac's analysis, however, it is a compound of the sulphuret and protoxide of antimony. Berzelius regards it as a union of sulphuret of antimony with a small portion of sulphuret of potassium; but the view taken of its chemical nature by Gay Lussac is now generally adopted as the most correct. When properly prepared, this article is in the form of a dark-brown powder, acquiring a much lighter tint

* ℞.—Calomel,
Antim. sulph. præcipit. āā ʒii.
Pulv. guaiac. ʒiv.
Sapo. venet. ʒiii.
M. F. pil. āā gr. iii. Take from two to four, morning and evening.

† Burdach's Mat. Med. vol. ii. p. 407. Phil. Conrad. Fabricius, Diss. de Sulphuris Antimonii Aurant: eximio usu in Arthritide. Helmot, 1759.

‡ Paris's Pharmacologia.

when exposed, for some time, to the air. With the assistance of heat, muriatic acid decomposes it readily and completely, disengaging hydro-sulphuric acid.

Kermes mineral was first employed as a medicinal agent in France, in the early part of the last century. Its preparation and composition was for some years kept secret by a surgeon named La Ligerie; and its remedial virtues were so highly esteemed as to induce the French government, in 1720, to purchase the recipe for the benefit of the public.

The effects of this preparation do not appear to differ materially from those produced by the *precipitated sulphuret* mentioned under the preceding head. The French and German physicians employ it frequently in acute catarrhal and pneumonic affections, where the expectoration is scanty. I have myself often used it, in complaints of this kind, and sometimes with evident advantage. It is given in doses of from a half to two grains, with a view to its diaphoretic and expectorant effects.

Antimonium Tartarizatum. Antimonii et potassæ tartras. Tartar Emetic.—This is, in all respects, decidedly the most important antimonial preparation. It consists of a combination of the tartrate of potassa with the tartrate of antimony—the principle of its formation "being merely the saturation of the excess of acid in the bitartrate of potassa (cream of tartar) with protoxide of antimony."* It is composed of two equivalents of tartaric acid, one of potassa, three of protoxide of antimony, and two of water.

Tartarized antimony is a white, inodorous salt, of a peculiar acrid and nauseous taste, crystallizing in tetra-

* Paris's Pharmacologia: from which work chiefly I have taken the chemical and pharmaceutical character of this salt.

hedral prisms when prepared, according to the directions of the Dublin and United States Pharmacopeiæ, from the nitro-muriatic oxide of antimony. When prepared from the sulphuret, or from the glass of antimony, the salt crystallizes in rhombic octohedrons. When exposed to the air, these crystals slightly effloresce on the surface, and lose their diaphanous appearance. They are wholly insoluble in alcohol; but cold water dissolves about one-fourteenth part of its weight, and boiling water one-half its weight of the salt. Upon this point, however, the experience of different observers varies considerably. Thus, according to Dr. Duncan, boiling water dissolves only one-third its weight of tartar emetic; and Dr. Percival asserts that it dissolves in twelve times its weight of cold water. The watery solution of tartar emetic reddens litmus, and gradually "undergoes spontaneous decomposition by keeping." The mineral acids, added to a solution of this salt, render it turbid; and the alkalies and their carbonates decompose it, and precipitate the antimony in the state of a protoxide. Many of the metallic salts and oxides also decompose it, particularly the acetate and subacetate of lead; and the same effect is produced by soaps, lime-water, muriate of lime, and hydro-sulphuric acid and its compounds. The infusions and decoctions, also, of many bitter and astringent vegetables, more especially the Peruvian bark, galls, rhubarb, oak-bark, and catechu, decompose this salt. An ounce of the decoction of yellow bark is said to be capable of decomposing twenty grains of tartar emetic, and of course rendering it almost wholly inert. It is manifest, therefore, that the exhibition of tartarized antimony, in combination or in concomitance with any of these substances, must, in a great degree, defeat the purpose for

which this preparation may be administered. The alkaline sulphates, if perfectly neutral, do not affect this salt. When, however, "there is an excess of acid, as in alum and bi-sulphate of potassa, &c. then its decomposition is effected, and a white insoluble sulphate of antimony is precipitated." "It appears, therefore," adds Dr. Paris, "that the famous 'emeto-purgative' of the French school, consisting of sulphate of soda and tartarized antimony, in solution, is by no means the unchemical mixture which some have considered it to be, and that it really produces its effects from the operation of its original ingredients, and not from that of the compounds (*sulphate of antimony, tartrate of soda, and sulphate of potassa*) which have been erroneously supposed to result."

The effects of tartar emetic on the living economy are various, according to the dose administered. Given in very minute doses, as one-sixteenth or one-twelfth of a grain, it increases pulmonary secretion, and promotes expectoration. Exhibited in the dose of one-quarter or one-third of a grain, it augments the cutaneous transpiration, as well as the secretion of urine. In the dose of one-half to one grain, it increases the secretion of the saliva, the gastric and intestinal mucus, and occasions nausea and alvine discharges. In a still stronger dose, from two to four grains, it speedily excites nausea, and full and perfect emesis. If it be given in an over-dose, it produces inflammation of the stomach and bowels. Magendie states that he found the mucous coat of the digestive and pulmonary organs of those who had died of excessive doses of this substance, to exhibit marks of inflammation.* It also affects the nervous system,

* De l'Influence de l'Emetique sur l'Homme et les Animaux. Paris, 1815, 8vo.

producing vertigo, anxiety, insensibility and delirium. Brodie thinks that tartrate of antimony acts directly on the brain. In some experiments he performed with this substance on living animals, he saw paralysis, insensibility, and torpor produced, unattended by any other effects to which these symptoms could be ascribed as secondary results.* Its most important operation, however, independent of its emetic effects, is the sedative influence which it exerts on the animal economy. The control which it exercises over the action of the heart is sometimes so great as to produce syncope, and even death. Brodie, after having given large doses of this salt to animals, found, on opening them, that the heart beat exceedingly feeble, and although artificial respiration was kept up, it soon ceased to act.

As a vomit, tartar emetic is the most important article we possess. Its effects are certain, prompt, and energetic. It occasions more complete agitation, and a stronger impression upon the whole nervous system, than ipecacuanha; and is not apt, like this latter substance, to leave the bowels in a constipated state. It acts also with greater certainty in producing diaphoresis; and finally, it operates in smaller doses, and is less disagreeable to the taste.

Tartarized antimony, either as an emetic, or as a means of curbing the action of the heart and arteries, or of inducing diaphoresis, is one of the most useful remedies in febrile diseases. Cullen, who was particularly

* Orfila gives the following general symptoms of poisoning by tartar emetic. "Rough metallic taste, nausea, copious vomitings, frequent hiccup, cardialgia, burning heat in the epigastrium, pains of the stomach, colic, inflation, copious stools, syncope, small contracted and accelerated pulse, cold skin, sometimes intense heat, difficult breathing, vertigo, loss of sense, convulsive movements, painful cramps in the legs, prostration of strength, death." To these symptoms difficulty of swallowing is sometimes joined.

fond of prescribing this article in fevers, thought that its good effects in this respect depended mainly on the *nausea* which it produces when given in minute doses. This opinion is, however, controverted by Fordyce, and more recently by Balfour, Lanthois, and others. It is contended by these writers, that this medicine is most efficacious in fevers, when it produces little or no sensible effects on the stomach. The two latter writers, especially, bring forward strong evidence of its possessing sedative powers, independent of its diaphoretic or nauseating effects. The experiments of Brodie, already mentioned, are also in evidence of the correctness of this opinion.

Upon this subject Dr. Chapman observes, "Emetics seem to do good in the cure of fever by exciting their *own* specific or peculiar action, and when they disorder the stomach by sickness, they depart from this, and, if they do not act as poisons, always become *nugatory*, or more or less *mischievous*."

That tartar emetic has a tendency to lessen febrile excitement, independent of its nauseating effect, is unquestionable; yet the declaration that the *nausea* which it creates renders its anti-febrile effects "nugatory or mischievous," is wholly unsupported by experience. All that can be correctly said upon this point is, that the good effects of this remedy in acute diseases, are not confined to *nauseating doses;* just as the anti-syphilitic powers of mercury are not confined to its salivating effects.

The idea that tartar emetic "departs from its specific or peculiar action when it creates *nausea*," is to me altogether incomprehensible. *Nausea* is but an intermediate link in the chain of effects produced by this remedy; and to say that its peculiar operation ceases

when this effect supervenes, appears to me to carry with it its own contradiction, and certainly is without the shadow of a proof. We might, with just as much propriety, assert that when mercury produces ptyalism, it departs from its peculiar or specific action, and becomes "nugatory or mischievous."

It appears to be beyond a doubt, that tartar emetic has a specific power of moderating the action of the heart and arteries; and upon this power, doubtless, its good effects in acute diseases mainly depend. Although this effect of the remedy, namely, the reduction of arterial excitement, may take place, independent of *nausea*, yet there are no facts which can lead us to believe that it *ceases* when nausea comes on. Every thing, on the contrary, clearly demonstrates, that when nausea does supervene, the action of the sanguiferous system is still more prostrated. From what I have observed of the operation of antimonials in the cure of fevers, I am of opinion that its good effects will be most decidedly manifested, when it is given in doses just sufficient to create and sustain very *slight* nausea.

Much of the advantage of this, as perhaps of all other remedies, depends, I conceive, on keeping up an equable impression upon the system. If the degree of the action be greatly varied, irregular and fluctuating determinations must take place in the body. For it must be observed, that, in proportion as the action of a remedy rises in degree, so does it successively bring under its more especial influence particular organs of the general system; and hence, if its impressions fluctuate in intensity, there will be a corresponding fluctuation in the excitement of the organs upon which the peculiar powers of the remedy determine it to act. Thus a dose of tartarized antimony acts first upon the nerves

and brain, whose influence, according to the experiments of Brodie, it diminishes. As a necessary consequence of this, the capillaries, being more immediately under the nervous influence, fall into a corresponding state of relaxation, and give rise to a freer discharge of the perspiratory fluid. If the action of the remedy rise still higher in intensity, it brings under its influence the stomach, giving rise to the sensation of *nausea;* this effect being the result of a greater degree of sedative operation than the preceding ones, is attended with an augmented relaxation of the cutaneous capillaries, and consequently with a more profuse discharge of perspiration. A still higher degree of the influence of the remedy directs its action more especially upon the muscular fibres of the stomach, diaphragm, and upon the abdominal muscles, all of which it brings into violent and simultaneous contraction. From all this it is evident that, by frequently varying the degree of action of our remedy, we keep up an irregular fluctuation of the excitement of the organs which it affects, a circumstance which I conceive must interfere very considerably with its salutary operation.

It is upon this principle, therefore, that I would object to the employment of *nauseating* doses of antimonial remedies, and not upon the supposition that their febrifuge effects are incompatible with their nauseating operation. In order to obtain the full advantages of these remedies, their action must be kept up for a considerable time. But it is often extremely difficult to keep up a *nausea* for any length of time, in consequence of its distressing effects upon the patient. It is, therefore not frequently sustained with uniformity, and generally often interrupted. Hence we have its chief action at one time concentrated upon the stomach and

cutaneous capillaries, and again suddenly withdrawn from these, and directed almost exclusively upon other parts. These disadvantages are avoided by exhibiting the remedy in doses insufficient to excite nausea; since, in such under-doses, its effects are confined exclusively to the nervous and sanguiferous systems, whose actions it moderates without producing any fluctuations in the excitement of particular organs. If in prescribing antimonials, we can keep up a continued and uninterrupted nausea, for an adequate length of time, we should, I am persuaded, obtain the full advantages of the remedy. But as there is a difficulty in effecting this, it will, I think, be best either never to carry it to the point of producing nausea, or perhaps, as I have already said, just far enough to excite this sensation in a very slight degree. This may be further illustrated by the effects which mercury produces on the system. Thus, while we keep up a uniform ptyalism, we fully obtain the sanative effects of this substance, in perhaps as short a period as possible. If, however, it becomes frequently interrupted, and again renewed, we derive much less benefit from it than we do either from a course of continued salivation, or from one in which the mercury is never carried to the extent of producing this effect.

I conceive, therefore, that the antiphlogistic operation of the antimonial preparations depends mainly upon *their sedative effects;* first on the nervous system, and consecutively on the heart and arteries; and that these effects will be the more advantageous as they are more equably diffused throughout the whole system.

The sedative or contra-stimulant operation of tartar emetic, has, indeed, of late years, been incontestably established by Tommasini and Rasori. So powerful are its effects, in this respect, that it may, it is said, be

advantageously substituted for venesection in phlegmasial affections. I have, myself, seen a few instances in which the extraordinary sedative operation of this article in *large doses* was strikingly illustrated. It appears, from the observations that have been published on this subject in Italy and in France, that in febrile or inflammatory diseases, the stomach will generally bear large doses of tartar emetic without being excited to nausea or vomiting. Dr. Fontaneilles of Milan, asserts that the power of the system to sustain large doses of this article, without emesis, depends almost entirely on the system being in an inflammatory excitement; for in health, or after a febrile disease is partly subdued, the ability of taking large doses of this antimonial, without nausea or vomiting, does not exist.*

Dr. Balfour, in a late work on the sedative effects of tartar emetic, speaks in the highest terms of small doses of this remedy in febrile affections. "Tartar emetic," he says, "is eminently efficacious in chronic as well as acute disorders; in topical affections as well as in general derangement; and its efficacy in either case is not confined to *nauseating* doses. From its natural and powerful tendency to equalize the nervous power, it cannot fail, even where blood-letting is necessary in the first instance, to supersede the necessity of recurring to it so often, and carrying it to that degree which is found necessary when the lancet alone is trusted to, for the removal of inflammatory complaints."†

M. Lanthois, of Montpelier, has lately published a work, in which he adduces strong testimony in favour

* Archives Gánerales, Feb. 1824.

† Observations Illustrative of the Sedative Effects of Emetic Tartar, p. 8—12.

of the salutary operation of very minute doses of this remedy in phthisis pulmonalis. His mode of employing it is as follows: a grain of tartar emetic is to be dissolved in eight table-spoonfuls of distilled water. This is to be mixed with six or eight pints of water, but never more than twelve, nor less than six. "This is to be used for drink, either alone or with other drink, at meals, or with wine at all seasons and hours, and without any limited time, it being attended with no inconvenience."

In the treatment of some of the phlegmasial diseases, much reliance is placed on the sedative effects of this preparation by many eminent physicians of the present day. In Italy it has, in a great measure, taken the place of blood-letting in inflammatory diseases, and its decided and prompt antiphlogistic tendency, when given in strong doses, has been verified by the experience of a number of eminent physicians in France and Germany. In all phlegmasial affections, except those of the mucous membrane of the alimentary canal, this preparation has been found eminently useful. The general and local inflammatory action is frequently promptly and decisively redressed by its sedative operation. It has been found particularly beneficial in *pneumonia*, in which it is usually given by the advocates of the Italian doctrine, to the extent of from a scruple to several drachms in the course of twenty-four hours. M. Laennec speaks decidedly in favour of large doses of tartar emetic in pneumonic affections; and he asserts, that when these diseases are treated by bleeding, chiefly, the pulmonary engorgement continues much longer than in cases that have been treated by large doses of tartar emetic. Given to the extent of from twelve to twenty grains during the day, this article, he

says, acts specifically in subduing inflammation, and powerfully promotes absorption. It appears from the observations of M. Fontaneilles, that the power of bearing large doses of tartar emetic without much nausea and vomiting varies in different stages of the disease. It is the greatest, he says, at the acme, and decreases in proportion as the disease disappears. He generally gives about twelve grains per day in the first stage; when it has arrived at its acme, from a scruple to half a drachm are given during the same period. If the medicine produces active vomiting, the dose must be diminished.

For the reduction of enlarged and indurated spleen, so common after protracted intermittents, tartar emetic, taken in small, but frequent doses, sometimes proves decidedly beneficial. It is equally useful for the removal of that dry and jaundiced state of the skin, with œdema of the feet, which is apt to remain after protracted miasmatic fevers. One grain of this antimonial, dissolved in three pints of water, or some mild and pleasant ptisan, and used as common drink for two or three weeks, will generally clear the skin of its icterode hue, and keep up a regular action of the bowels and cutaneous exhalents.

Given in this way I have also known this article to act very beneficially in subacute rheumatic affections, more especially in those instances of rheumatic muscular pains and œdema, which are apt to proceed from the influence of cold, during convalescence from scarlatina and measles.

I have already mentioned the employment of emetics in hernia humoralis. In this affection the tartrate of antimony is decidedly more efficacious than any other emetic. It should be given so as to produce full vomiting.

James' Powder, a preparation which approaches very nearly to the character of tartar emetic, is said to be highly useful in hydrocephalic affections. Dr. William Stoker, of Dublin, who speaks particularly in favour of its efficacy in affections of the head, has also published some very favourable results from its use in apoplectic cases. He affirms, that it has a decided tendency to diminish the determination of the blood to the head; and that a continued use of it, in small doses, generally tends to diminish the disposition to apoplexy.*

Tartar emetic is sometimes employed, in nauseating doses, to bring on relaxation of the muscles, in order to facilitate the reduction of dislocated joints. Dr. Chapman says, that he has known it to be advantageously administered in the form of an enema, for the purpose of evacuating the stomach, in order "to remove poison which had been swallowed." He has also used the remedy in this way, in a case of tetanus, "with such complete success," that he entertains "the hope that, under this treatment, the disease may hereafter be divested of some portion of its terrors and mortality." This practice has, I believe, never been resorted to by any other physician.

Dr. Witzman, a Russian physician, has lately recommended the employment of tartar emetic for removing opacity of the cornea. The remedy is to be applied in the form of an ointment, composed of fresh butter and castor oil āā. ʒi. tart. antim. gr. iv. and afterwards gradually increased to twenty grains. A small portion of this ointment is to be put into the eye every morning and evening; and a warm compress applied pretty firmly, for two or three hours after the introduction

* Dublin Medical Essays, anno 1806. See also vol. ii. p. 43, of the "Transactions of the King and Queen's College of Physicians, Ireland."

of the ointment, in order to allay the pain which it sometimes creates.* For an account of the employment of tartar emetic as a counter-irritant, the reader is referred to the chapter on rubefacients in the second volume of this work.

Tartar emetic, as has already been stated, is capable of acting with great violence; and when the quantity taken is enormous, its effects are eminently deleterious. If it excites great vomiting, with cramp in the stomach, the patient should be directed to take copious draughts of sugar and water. "If the vomiting do not cease after the tartar emetic may be supposed to have been ejected, and the pain is augmented, a grain of opium may be given, and repeated at an interval of a quarter of an hour, for two or three times, if the symptoms be not calmed." When the symptoms continue still to increase, leeches should be applied to the abdomen and throat. If the individual who has taken the antimonial preparation does not vomit, and yet suffers from the other symptoms, several glasses of sugar and water should be taken; if, in spite of this, vomiting do not occur, the following should be given at repeated doses: "put four or five gall-nuts into two quarts of water, let them be boiled together for ten minutes, and then strained. Experience has proved that gall-nuts are to be preferred to any other astringent; but, in default of them, two ounces of Peruvian bark, or the bark of oak or willow, may be employed."† If, notwithstanding these applications, the symptoms continue, we must resort to general and local depletions, blisters, or fomentations to the region of the abdomen, together with copious draughts of mucilaginous drinks, warm bath, &c.

* Russian Physico-Medical Repository, &c., edited by E. Martini.

† Orfila's Directions for the Treatment of Persons who have taken Poisons, page 60.

M. Sauventon, of Lyons, has lately published a case, illustrating the good effects of the Peruvian bark in cases of poisoning by this article. A lady swallowed, by mistake, about a drachm of tartarized antimony in whey. M. Sauventon saw her in ten minutes after, and immediately administered about two ounces of tincture of yellow bark, diluted in several glasses of cold water. The only injurious effects the patient experienced from the poison was some nausea and epigastric pain, which latter continued more or less for four or five weeks.*

Formulæ.

℞.—Pulv. ipecac. ℈i.
Tart. antimon. gr. ii.—M. To be taken at once, as an active emetic.

℞.—Tart. antimon. gr. viii.
Aq. fontanæ ℥iv.—M. Take a table-spoonful every ten or fifteen minutes, until vomiting is excited.

℞.—Sulphat. magnesiæ ℥iss.
Tart. antimonii gr. ii.
Aq. fontanæ ℥v.—M. Take a table-spoonful every hour, until it operates as an emeto-cathartic.

NITROUS POWDERS.

℞.—Pulv. nit. potassæ ʒiss.
Tart. antimonii gr. i.
Calomel gr. vi.—M. Divide into six equal parts. Take one every hour or two.

ENEMA.

℞.—Tart. antimon. ℈ss.
Decocti hordei Oj.

SULPHAS ZINCI.—WHITE VITRIOL.

Sulphate of zinc consists of a white, semi-transparent salt, crystallizing usually in slender four-sided prisms, terminated by four-sided pyramids. It efflor-

* Med. Chir. Rev. July, 1826, p. 285.

esces on the surface when exposed to the open air, and has the property of reddening vegetable blues. It has a styptic, metallic and somewhat acidulous taste. It is dissolved by 2.5 times its weight of water at the temperature of 60°; and by less than its weight of boiling water. Alcohol has no action on it. "When heated, it dissolves in its water of crystallization, which gradually evaporates; and by prolonged ignition, the whole of the acid is expelled, and oxide of zinc is left." The caustic alkalies precipitate its oxide, and afterwards dissolve it when added in excess. The alkaline carbonates, earths, hydro-sulphurets, astringent vegetable infusions, and milk, destroy or weaken its styptic powers. Ammonia, however, produces no change in a solution of *pure* sulphate of zinc, but the ferro-cyanate of potassa produces a white precipitate.

As this preparation of zinc is usually met with in commerce or in shops, it consists of irregular, white and opaque masses, of a granular structure, bearing some resemblance to white sugar. In its crystallized state, the salt is composed of one equivalent of sulphuric acid = 40, one of zinc = 42, and seven of water = 63. The amorphous or common white vitriol of the shops, contains only three equivalents of water.

Its remediate effects vary according to the dose in which it is administered. Given in a small dose, from one-half to two grains, it acts as an astringent tonic. In larger doses, from ten grains to ʒss. it is strongly emetic.

Sulphate of zinc is the most prompt emetic with which we are acquainted; and hence its peculiar applicability to cases where poison has been swallowed, and where, of course, it is of the utmost consequence to procure speedy and effectual vomiting. Previous to

the discovery of tartarized antimony and ipecacuanha, this preparation of zinc was very commonly employed as an emetic in all cases where emesis was desired. At present, however, its use as an emetic is almost entirely restricted to the purpose just mentioned. The objection alleged against its employment by Cullen, namely, "that it is apt, if not thrown up again immediately, to continue a disagreeable nausea, or even vomiting, longer than is necessary," does not appear to be well founded. Moseley, indeed, gives quite a contrary character to this remedy. His experience with it was very extensive, and his opinion upon this point is, therefore, entitled to respect. He affirms, "that the patient is not harassed with its operation; that it is never violent as antimonials are, and generally instantaneous, and suddenly over, always leaving the stomach strongly invigorated. Neither does it cause spasms in the viscera, nor any nervous affections—mischiefs often produced by the antimonials."

I have exhibited this substance, with a view to its emetic operation, in a very considerable number of instances, and sometimes to the extent of thirty grains, without ever noticing any of the disagreeable consequences mentioned by Cullen. It does not appear, indeed, that its effects on the system, even when taken in excessive quantities, are eminently deleterious. Orfila mentions the case of a young lady, who by mistake took a solution of two ounces of white vitriol. On his arrival, "he found the lady in a dreadful situation; her countenance was pale and sunk; the extremities cold, the eyes dim, and the pulse convulsive." Vomiting, however, soon came on, which was promoted by draughts of warm water. After the greater portion of vitriol had been evacuated, "he set about decomposing

the rest by means of the fixed alkali, diluted with sugar-water." The vomiting now ceased instantaneously, and in less than two hours she was free from every painful or alarming sensation.

Richter states that he has frequently given this article as an emetic in the commencement of typhus with great advantage; and from its sudden and rapid operation, there can be no doubt that it is well calculated to do good in affections of this kind, since the general shock and agitation of the system produced by emetics are, perhaps, the principal source of the benefits afforded by these remedies.*

It has also been recommended as an emetic, in the initial stage of bilious fevers, and for arresting the progress of intermittents. For this latter purpose, a full emetic dose should be given as soon as the patient begins to feel the premonitory symptoms of the approaching paroxysm. Given at this period, it is said frequently to prevent the development of the paroxysm, and thus often to arrest the progress of the disease effectually. (*Richter.*)

Moseley recommends this remedy as very useful in dysentery. "I give it," says he, "at first without alum, in sufficient doses to cause evacuations, and afterwards with the alum, in nauseating doses, and frequently with opiates at night."† I have used this preparation in the dysentery of children, after it had assumed a chronic character, and generally with considerable advantage. I have always, however, confined myself, in these cases, to the employment of nauseating doses; and it should

* Specielle Arzneimittellehre, Bd. 2. p. 538.

† The following is his formula, for exhibiting the white vitriol with alum. Sulp. zinci, ʒiii. sulp. alum. ʒi. pulv. coccinel. gr. iii. aquæ bulentis, ℔i. Mix these in a mortar, until the solution is cold and the sediment deposited, then pour it off. Dose, a table-spoonful for an adult.

never be used until the inflammatory symptoms have been moderated by depletory measures, and the bowels freely evacuated by suitable laxatives. In referring to the testimony of Moseley, in favour of this practice, it must be recollected that he employed it in *tropical* dysenteries; a circumstance which may, perhaps, account for its less favourable results in the treatment of the disease in more northern climates. Mr. Bampfield, who has published an excellent book on tropical dysentery, makes the following observations, in relation to Moseley's zinc mixture. "The mixture of sulphas zinci and alum, recommended by Dr. Moseley, has nearly the same effects on the intestines as the infusion of simarouba, if there be an excess of alum. It is extremely difficult to adapt the proper quantity of alum to the astringent effect required; when it produces constipation, the morbid secretions, tormina, &c. are increased, and sometimes induce an actual relapse, and when the excess of sulphas zinci maintains a free discharge of natural fæces, the morbid secretions are diminished."*

In the treatment of diarrhœa, this remedy appears to be more decidedly advantageous, and is certainly less hazardous than in dysentery.

Dr. Moseley speaks also in favour of the employment of the zinc and alum solution, in colica pictonum. After the bowels are evacuated by suitable purgatives, a table-spoonful of the solution is to be taken every five or six hours, until the pain ceases. Of this practice I can say nothing from my own experience, nor does it appear to have gained much credit with the profession.

Since, however, the preceding remark was written, I have employed this solution in two cases of colica pic-

* Practical Treatise on Tropical and Scorbutic Dysentery, p. 193. London, 1819.

tonum, and in both instances unequivocal benefit was derived from it. The proportion of alum, however, in the solution I employed, was double that which is given in the formula, at the foot of page 82.

To relieve hooping-cough, the sulphate of zinc is, undoubtedly, a remedy of very considerable powers. For this purpose I have prescribed it in a few instances with considerable advantage. I think it decidedly superior to the antimonial emetics, in cases where there is much pulmonic oppression, or difficult respiration. The only objection to its use, is its very disagreeable taste, a circumstance, indeed, which renders its employment with children extremely difficult, and often altogether impracticable.

As an expectorant, in chronic catarrhal affections, attended with oppressed breathing and a tough mucous expectoration, the same writer whom I have already so often mentioned, speaks in exalted terms of his "vitriolic solution." He directs it to be taken in slightly nauseating doses, three or four times a day. In phthisis, attended with bloody expectoration, he declares this remedy to be often of signal service. In all these affections I have occasionally employed it, but never with any decided advantage. Dr. Paris, however, adds his testimony in favour of the use of this remedy in pectoral complaints. "In affections of the chest," says he, "attended with inordinate secretion, I have witnessed much benefit from its exhibition, particularly when presented in the form of lozenge."

The sulphate of zinc has, of late years, been much extolled, by some practitioners, as an emetic in cynanche trachealis, and C. laryngea. Dr. Hosack has made some statements, which go to show that prompt and peculiar advantages may often be obtained from emetic

doses of this article in croup. Dr. Francis, of New York, has employed it, in this affection, with marked success. In three instances, after the frequent but unavailing use of antimonial and ipecacuanha emetics, and in an apparently hopeless condition of the patients, the exhibition of a solution of sulphate of zinc, (a drachm to an ounce of water,) in doses of a tea-spoonful every ten minutes, caused, by the sudden and energetic vomitive efforts it excited, the separation and expulsion of the false membranes which had been formed in the trachea and larynx, and secured the recovery of the patients.*

This article may also be very appropriately and successfully used as an emetic, in cases of apoplexy excited by an over-loaded stomach, or by indigestible and oppressive ingesta.

Under the head of astringents this remedy will be again noticed, to which the reader is referred for an account of the various other uses to which it has been applied in medical practice. "The white vitriol of commerce," says Dr. Paris, "ought never to be used in medicine, since it generally contains the sulphates of copper and iron."

SECONDARY EMETICS.

LOBELIA INFLATA.—INDIAN TOBACCO.

This is a biennial plant, indigenous to the United States, in many parts of which it grows in great abundance. For a particular description of this species of lobelia, the reader is referred to Dr. Bigelow's Ameri-

* Essays on Various Subjects of Medical Science. By D. Hosack, M. D.

can Medical Botany, and to Dr. Barton's Vegetable Materia Medica of the United States, where accurate figures are given of the plant. The leaves, capsules and root of this plant are exceedingly acrid; when "held in the mouth for some time, they produce giddiness and pain in the head, with a trembling agitation of the whole body; at length they bring on extreme nausea and vomiting. The taste resembles that of tartar emetic."*

As an emetic, the lobelia inflata is very active, producing, in strong doses, "great relaxation, debility, and perspiration." Concomitant with its emetic operation, it sometimes acts on the bowels and produces purging. Shoepf, a botanist who travelled through this country about eighty years ago, is the first writer who has mentioned this plant as possessed of medicinal properties. He notices it, however, only as "*astringent and used in ophthalmia*," without saying any thing further concerning its medicinal powers. Our knowledge of its virtues as a medicine has been chiefly derived from the account given of its effects by the Rev. Dr. M. Cutler, whose experience with it appears to have been very considerable. He found it particularly serviceable in asthmas. "It has been my misfortune," says he, "to be an asthmatic for about ten years. I have made trial of a great variety of the usual remedies, with very little benefit. In several paroxysms I found immediate relief, more frequently than from any thing else, from the skunk-cabbage, (pothos fœtidum.) The last summer I had the severest attack I ever experienced. It commenced early in August, and continued about eight weeks. Dr. Drury, of Marblehead, also an asthmatic, had made use of a tincture of the Indian tobacco (lobelia inflata) in

* Bigelow's Medical Botany, vol. i. p. 179.

a severe paroxysm, early in the spring. It gave him immediate relief, and he has been entirely free from the complaint from that time. I had a tincture made of the fresh plant, and took care to have the spirit fully saturated, which I think is important. In a paroxysm, which, perhaps, was as severe as I ever experienced, and the difficulty of breathing extreme, after it had continued for a considerable time, I took a table-spoonful. In three or four minutes my breathing was as free as it ever was. In ten minutes I took another spoonful, which occasioned sickness. After ten minutes I took the third, which produced sensible effects on the stomach, and a very little moderate puking, and a kind of prickly sensation through the whole system, even to the extremities of the fingers and toes. Since that time I have enjoyed as good health as, perhaps, before the first attack."* Other practitioners have employed this article with decided advantage in asthmatic affections. Dr. W. P. C. Barton mentions a case of this kind, in which he exhibited a tea-spoonful of the tincture every two hours, with speedy and obvious benefit. Dr. Stewart, also, as I am informed by Dr. Barton, has obtained unequivocal advantages from the employment of this remedy in a case of spasmodic asthma. Dr. Cutler has found it a very useful pectoral "in consumptive and other coughs depending on mucus accumulated in the bronchial vessels."

Since the publication of the first edition of this work, I have had several very striking examples of the good effects of this article in asthma. Its operation is, indeed, often surprisingly prompt and effectual in this disease. I have known the most frightful paroxysm

* Thacher's Dispensatory.

completely allayed in less than fifteen minutes. My experience, since the last edition, has still further confirmed my confidence in this article as a remedy in asthma. Even where the disease depended on organic affection of the heart, it has, generally, speedily mitigated the distressing difficulty of respiration.

As an emetic, I have employed it in several cases of croup, with very great benefit. I have also used it effectually, instead of tobacco, in the form of an enema, to facilitate the return of a strangulated hernia.* I have, within the last four years, employed it in a number of cases of hooping-cough,—and in several instances with unequivocal advantage. From fifteen to twenty drops in union with ten or twelve drops of the syrup of squills, may be given every two or three hours to a child of between one and two years old. Combined with the extract of belladonna, it forms a most valuable remedy in this affection. I have used this combination with immediate and very decided benefit. By dissolving about five grains of the extract in an ounce of decoction of lobelia, (half an ounce of the plant to half a pint of water), and giving it in doses of from twenty to sixty drops, according to the age of the child, three or four times daily, will seldom fail (as I confidently believe) to mitigate, very decidedly, the violence and frequency of the spasmodic cough. In a weak or torpid state of the stomach, unattended with symptoms of inflammatory irritation of the mucous membrane of this organ, I have found small doses of this medicine highly beneficial. It evidently possesses the power of exciting the pneumo-gastric nerves, and, when indigestion depends on a mere want of activity

* Barton's Vegetable Materia Medica, vol. i. p. 197—9.

in the stomach, its effects in exciting the nervous energies of this organ, are often promptly and conspicuously advantageous.

The plant should be collected in August, and plucked up by the roots. Every part of it possesses active qualities, but the roots and the inflated capsules are decidedly the most powerful. It may be given either in the form of powder or tincture. The latter is, however, the most convenient mode of exhibiting this remedy. The formula adopted in the American Pharmacopœia, for making the tinctura lobeliæ, is given below.* As an emetic, we may give from ten to twenty grains of the powdered leaves, to an adult. In smaller doses its effects are expectorant. The saturated tincture is administered in the dose of from twenty to forty drops, to children of one or two years old.

SPIRÆA TRIFOLIATA.—INDIAN PHYSIC.

This is an icosandrous plant, and found in considerable abundance throughout almost every part of the United States. Its root is perennial, sending up annually several slender stems, to the height of several feet, branching above, and of a reddish colour. It flowers in June and July, and delights in hilly woods or on the borders of rivulets. The root, which consists of "long, brown, slender branches, radiating from a thick tuber," is the part employed for medicinal purposes. It is said that the cortical part of the root alone possesses active qualities. "The predominant soluble ingredients in

* ℞. Lobeliæ uncias duas.
Alcoholis diluti octantem unum.
Digere per dies decem, et per chartam cola.

this root appear to be a bitter extractive matter and resin. When boiled in water, it imparts to it a beautiful deep red-wine colour, and an intensely bitter taste. This decoction undergoes no change from the action of alcohol or gelatin, though it gives a precipitate with muriate of tin. Water distilled from the root has its peculiar flavour with a little of the bitterness. A large portion of resin is precipitated on the addition of water to an alcoholic tincture of the root."* From my own experience with this plant, which has not been inconsiderable, I am led to regard it as very little inferior to the official ipecacuanha, as an emetic. Like this latter article, it is a safe and efficacious vomit. While practising in Lancaster county, I employed this plant very frequently as an emetic, in the treatment of intermittent and bilious fevers, and it very seldom disappointed me of the desired effect. Dr. Bigelow, however, observes, that from his own experience with this remedy, he was led to regard it as an emetic of very uncertain operation.

Given with opium, I have found it particularly serviceable as a sudorific in dysenteric affections; and from what I have observed of its effects in other cases, it appears to me, that the opinion entertained by the late Dr. Barton, of its possessing tonic properties, is not without foundation. In small doses, from two to four grains, I have taken it myself, when suffering from dyspepsia, and generally with some advantage.

As an emetic it should be given in the dose of about thirty grains of the powdered root. It should be collected in September. Accurate figures of this plant are given in the first volume of Barton's Vegetable Materia

* Dr. Bigelow's American Medical Botany, vol, iii. p. 14.

Medica of the United States; and in the third volume of Bigelow's American Medical Botany.

EUPHORBIA IPECACUANHA.

This plant is found no where except in the United States. The root is perennial, long, tuberculated, from half an inch to an inch in diameter, and of a yellowish colour. It is light and brittle when dried, and has a sweetish and not very disagreeable taste. Dr. Bigelow subjected this root to chemical examination, from which it appears, that—"sulphuric ether digested on the powdered root dissolved a part of it; and this ethereal solution gives a precipitate if alcohol is added to it. Alcohol alone takes up another portion of the root, and assumes a pearly turbidness after water is added. Both the ethereal and alcoholic solutions, evaporated to dryness, leave a residuum which is fusible and inflammable. The decoction gives no precipitate with gelatin or sulphate of iron. With alcohol it gave out a white precipitate, which rendered the solution turbid, and subsided in flocks. The cold infusion exhibited the same phenomena in a smaller degree. From these experiments we may infer that the root contains caoutchouc, resin, mucus, and probably fecula." For a good description and figure of this plant, the reader is referred to Dr. Barton's Vegetable Materia Medica, vol. i. p. 213, and to Dr. Bigelow's American Medical Botany, vol. iii. p. 111.

The emetic virtues of this plant had been but little noticed, until they were more particularly investigated by Dr. Barton, the present Professor of Botany in the University of Pennsylvania. In his work, to which we

have just referred, he observes: "That the Euphorbia Ipecacuanha is possessed of virtues entitling it to supersede the use of the imported ipecacuanha, my own extensive experience with it, corroborated by the numerous trials of the medicine by Professor Hewson; my brother, Dr. J. R. Barton, of the Pennsylvania Hospital, and others, all embolden me to declare." Dr. Bigelow states, that, in the trials which he has made with it, he has found it, in the majority of instances, to operate with as much ease as the other emetics. In large doses, however, "it excites active and long-continued vomiting, attended with a sense of heat, vertigo, indistinct vision, and prostration of strength."* From what I have myself seen of this remedy, I am satisfied that it is well worthy the attention of the profession. Given in the dose of from fifteen to twenty grains, the powdered root of this plant acts as a safe and efficacious emetic. It seems to have a greater tendency to act on the bowels than ipecacuanha, as I have known it to produce very considerable purging. In the dose of twenty-five grains, Dr. Barton has known it to produce hypercatharsis, which continued for fourteen hours. It may be advantageously substituted for ipecacuanha, in the various "combinations into which this latter substance enters as a part." As the officinal ipecacuanha is but seldom very good, or perhaps unadulterated, it is a matter of very considerable importance to attend to such native articles as promise to become adequate substitutes in its place. In this respect there is, perhaps, no indigenous vegetable known, which deserves greater attention from the profession than the Euphorbia Ipecacuanha.

* American Medical Botany, vol. iii. p. 112.

SCILLA MARITIMA.—SQUILL.

The squill belongs to the liliaceous plants. It is a maritime plant, and found in great abundance on the sandy coasts of Portugal, Spain, Sicily, &c. The root, which is the only part employed in medicine, consists of a large bulb, composed of fleshy scales, which overlap each other and give it a pyriform shape. It has no odour, but is bitter, nauseous, and acrid to the taste. The recent root will inflame the skin if kept in contact with it for any considerable time. According to the analysis of Vogel, it contains six parts of gum, twenty-four of tannin, six of sugar, thirty-five of bitter principle, (*Scillitin*, which is white, transparent, and breaks with a resinous fracture,) and thirty of woody fibre.*

The squill, when taken in very large doses, acts with great and dangerous violence on the animal economy. It has been known to produce excessive tormina, colic, and even convulsions. Alibert asserts that he has performed many experiments on animals with this substance, and that the result confirmed what had been said of its effects in this respect.

It is chiefly employed as a diuretic and expectorant; for both of which purposes it is, indeed, one of our most valuable remedies. As an emetic it is but little used. In the pectoral diseases of very young children, however, it may often be resorted to with peculiar advantage. I have frequently prescribed the syrup of squill, so as to produce vomiting, in the catarrhal affections of infants; and it has appeared to me in some instances to produce greater relief than usually arises

* American Medical Botany, vol. iii. p. 112.

from the operation of other articles of this class. In hooping-cough, too, the vinegar of squill, in union with vinum ipecacuanhæ, has appeared to me to constitute a peculiarly beneficial emetic. I have lately employed this mixture, in a few cases of this disease, with a highly satisfactory result. Two parts of the acetum scillæ, with one of the vin. ipecac. may be given in tea-spoonful doses, to a child between one and three years old.

The active principle of this root is readily and perfectly extracted by any of the usual menstrua. Water distilled from squill has neither taste nor smell, and is wholly destitute of active properties. According to the analysis of M. Tilloy, of Dijon, the *Scillitin* of Vogel is a compound of the proper active principle of squill, gum and uncrystallizable sugar. The scillitin, as obtained by Vogel, is soluble in water, alcohol and vinegar; but that which was procured by M. Tilloy was insoluble in water and in dilute acids, though readily dissolved by alcohol. It has an exceedingly acrid and bitter taste, and exerts a very powerful influence on the animal system. It is probable, however, as is remarked by M. Chevallier, that the active principle of this root "has not as yet been entirely isolated." The officinal preparations are, *Acetum scillæ*, U. S., Lond., Ed., Dub.; *Mel. scillæ compositum*, U. S.; *Oxymel scillæ*, U. S., Lond., Ed., Dub.; *Pilulæ scillæ compositæ*, Lond., Ed., Dub.; *Pulvis scillæ*, Ed., Dub.; *Syrupus scillæ*, U. S., Ed.; *Tinctura scillæ*, U. S., Lond., Ed., Dub.

To procure an emetic effect, the fluid preparations must be given in the dose of an ounce or more to an adult. A tea-spoonful of the syrup is generally sufficient to puke a child under a year old.

Alkalies diminish both the bitterness and acrimony of this root. Vegetable acids do not materially affect either of these qualities, but are supposed to increase its expectorant powers.

For an account of the other medicinal properties of this root see the chapters on Diuretics and Expectorants.

SANGUINARIA CANADENSIS.

This plant is generally known by the name of Puccoon, or blood-root, and grows abundantly throughout every section of the United States. It is among the earliest of our spring plants, shooting up its humble but beautiful white flowers, as soon as the frost leaves the earth. The root, which is the only part employed as a medicine, is red, horizontal, and tuberous; its taste is acrid, leaving an impression on the fauces some time after it is chewed. According to the minute analysis of this root by Dr. Fitzgerald Bird, it appears to contain cinchonin, extractive matter, a gummy matter, a resin, and gallic acid, in a state of combination.* The colouring principle of this root resides chiefly in its resinous parts, the alcoholic solution being always more than twice as highly coloured as the aqueous.†

The medicinal properties of the sanguinaria, have been very variously represented, and its powers do not appear to be, as yet, well understood. Dr. Bigelow considers this root as an acrid narcotic. Dr. Bird says that "its medicinal properties are in *every respect* similar to those which characterize the cinchona officinalis."

* An Inaugural Dissertation on the Sanguinaria Canadensis, by Fitzgerald Bird, of Georgia. New York, 1822.

† Bigelow's Medical Botany, vol. i. p. 79.

This, however, is certainly an erroneous estimate of its powers, for although it will often speedily put a stop to intermitting fever, its tonic virtues in this, as in every other respect, are incomparably below those of the cinchona. The late Dr. Barton valued it chiefly for its emetic and expectorant powers. Its properties are certainly very peculiar, being capable of producing tonic, narcotic, stimulant, or emetic effects, according to the dose and form in which it is administered. Taken in a large dose, it produces nausea, heat in the stomach, faintness, often vertigo and indistinct vision, and finally emesis. These effects are produced by doses of from eight to twenty grains.* In smaller doses, its effects on the pulse are analogous to those of digitalis. Since the last edition of this work was published, I have employed this article in a very considerable number of cases; and I am fully satisfied that its sedative influence on the action of the heart and arteries, is quite as certain, if not more so, than that of digitalis. It rarely, however, produces any obvious reduction of the frequency and tension of the pulse, until its use has been regularly continued for five or six days; and in the majority of cases in which I have employed it, I did not notice this effect on the pulse, until the eighth or tenth day of its use. Applied in the form of powder to fungous flesh, it evinces pretty active escharotic properties.

From the concurrent testimony of a number of eminent practitioners, the sanguinaria appears to be entitled to considerable attention as an article of the materia medica. Professor Francis, of New York, in an interesting paper on the medicinal properties of this plant, states that he has used it "with essential benefit

* Bigelow's American Med. Botany.

in a long protracted and distressing affection of the chest. The patient laboured under repeated attacks of pneumonia, and, notwithstanding very active treatment, had suffered by hæmorrhage from the lungs; the consequences were, much constitutional debility, and habitual returns of spasmodic dyspnœa, similar to those of pertussis. The tincture of the sanguinaria, to the amount of twenty drops, three times a day, has obviated the most formidable symptoms, and given strength and vigour to the constitution."* Dr. Ives, of New Haven, also speaks very favourably of its remediate powers in diseases of the lungs and liver. "In plethoric constitutions," he observes, "when respiration is very difficult, the cheeks and hands become livid, the pulse full, soft, vibrating, and easily compressed, the blood-root has done more to obviate the symptoms and remove the disease than any remedy he has used." It should be given in large doses in cases of this kind, he observes, and repeated until it produces vomiting. He also recommends it as highly useful in influenza, hooping-cough, and croup. In this latter disease, it must be given so as to produce vomiting.† In protracted catarrhal affections, assuming the character of incipient phthisis pulmonalis, the regular employment of small doses of the tincture of this root, has, in my practice, not unfrequently afforded complete relief. In cases of this kind, indeed, the article deserves to be regarded as undoubtedly among the most valuable remedial agents we possess. It seldom, however, produces any very obvious amendment in the symptoms of the disease, until its use has been regularly continued for about two weeks. After it has been persisted in for ten or

* New York Med. and Phys. Journal, vol. i. No. 2.

† Bigelow's American Med. Botany, vol. i. p. 81.

twelve days, the cough and frequency of the pulse begin to abate, and although this abatement is generally slow, it usually goes on regularly, until all the symptoms of pectoral and general irritation have disappeared. I have generally ordered the tincture (U. S. Pharm.) in doses of from twenty to thirty drops, three times daily; or in less doses, should this quantity excite nausea or vomiting, which it sometimes does in persons of feeble and irritable habits. For the troublesome cough and pectoral uneasiness which are sometimes left after an attack of croup, or pneumonia, I have in some instances prescribed this tincture with the most satisfactory results.

Dr. Francis, in the paper which I have already quoted, states that he has used this remedy with advantage in a "formidable case of acute rheumatism, occurring in a gouty habit, the patient having been previously prepared by copious blood-letting, cathartics, and sudorifics. The patient took thirty drops of the saturated alcoholic solution, three times a day." Dr. Macbride, of Charleston, South Carolina, in a letter to Dr. Bigelow, states that he has found it useful in hydrothorax, "given in doses of sixty drops *ter in die*, and increased until nausea followed each dose." I have administered this remedy in doses of about twenty drops a day (the saturated alcoholic tincture), with unequivocal benefit in an asthmatic affection. In this instance, the pulse became reduced about ten strokes in a minute. In another case of weakness of the breast, and copious mucous expectoration, it produced a similar diminution of the action of the pulse, but its good effects were not so conspicuous as in the former instance. In chlorosis, unattended by chronic inflammatory irritation of the mucous membrane of the alimentary canal, I have in several cases

known the sanguinaria given in union with the ferro-cyanate of iron (prussiate of iron) with peculiarly favourable effects.

As an external remedy, the powdered root has been found very beneficial "in ill-conditioned ulcers with callous edges, and an ichorous discharge." Professor Smith, of Hanover, New Hampshire, states that he has cured several polypi of the soft kind, by using it as a snuff.* I once employed it a long time in a case of this kind, and although it diminished the polypus very considerably for a time, I could not succeed in obtaining any permanent advantage by its use.

Dr. Francis very judiciously observes, that in a state of high general excitement, or in active local inflammation, its employment cannot but prove injurious; for, whatever may be its ulterior effects, it is always actively stimulant in its primary operation.

Two ounces of the powdered root to a pint of diluted alcohol, are recommended as proper proportions for making its tincture.

Formulæ.

℞.—Pulv. rad. sanguinariæ ℈i.
Ferri ferro-cyanat ℈ii.
Conserv. rosar - q. s.—M. Divid. in pil. No. xx. One or two to be taken three times daily.

℞.—Tinct. sanguinariæ ʒi.
Tinct. ferri muriat. ʒss.—M. From twenty to thirty drops, twice or thrice daily.

APOCYNUM ANDOSÆMIFOLIUM.—DOG'S BANE.

This plant is indigenous to the United States, and has been a good deal employed in some parts of this country, as an emetic. Some fifteen years ago, I pre-

* Lond. Medico-Chirurg. Transact. vol. i.

scribed it in several cases of intermitting fever, and found it a prompt, and in these instances, a mild and safe emetic. Given in small doses, it forms an excellent tonic in indigestion from debility and torpor of the stomach. The root of the plant alone is used. Its taste is unpleasant and intensely bitter. According to the experiments of professor Bigelow, it contains bitter extractive, a red colouring matter, soluble in water, but not in alcohol, caoutchouc, and volatile oil. Every part of the plant contains a glutinous milky juice. As a tonic it may be given in doses of from two to five grains, three times daily. About twenty-five or thirty grains of the recently powdered root is the proper dose when given with a view to its emetic operation. This root deserves more attention than it has yet received from the profession. The very considerable tonic powers which it unites to its emetic virtues, render it, we may presume, peculiarly suitable to dyspeptic cases. The Indians of this country employ this plant as a remedy in lues venerea.

Dr. Bigelow asserts that the active properties of the root are diminished, and ultimately entirely destroyed, by keeping.

RAD. VIOLÆ ODORATÆ.—SWEET VIOLET.

This species of viola has been introduced into the United States from Europe, and is abundantly cultivated in our gardens. The flowers have a very agreeable odour, and a slightly bitter taste. Boiling water extracts both these odoriferous and bitter principles, and the infusion affords an excellent test for acids and alkalies, "being reddened by the former, and rendered green by the latter." Drying, however, destroys their

odour entirely. The flowers "should be gathered before they are fully blown, deprived of their calyx, and rapidly dried, either in a heated room or by exposing them to a current of very dry air." M. Caventou asserts, that it contains a very large portion of *emetin*;* and Boullay† found a peculiar alkaline principle in every part of the plant, strongly resembling *emetin*, to to which he has given the name of *violine*. It consists of a white pulverulent substance, very sparingly dissolved by water, but entirely and readily soluble in alcohol, combining and forming neutral compounds with acids. In a natural state, as it exists in the plant, it appears to be combined with malic acid. According to the experiments of Orfila, *violine* is extremely active, and even poisonous.

The root of this species of violet, which has a bitter and somewhat acrid taste, possesses very considerable emetic properties, and has been used in croup and hooping-cough, with peculiar advantage. The dose of the powdered root, as an emetic, for an adult, is from thirty to fifty grains.

The leaves and flowers are mucilaginous, emollient, and slightly laxative, and "have been used in pectoral, nephritic, and cutaneous affections." I have known it to be used with decided benefit, instead of the *viola tricolor*, for the cure of crusta lactea. A drachm of the dried herb should be boiled in a pint of milk, until about one-third of the milk has evaporated. This must be taken in the course of twenty-four hours, and its use continued for four or five weeks.

* Dic. des Sciences Med. Tom. 58, p. 158.

† Journal de Pharme. T. 10, p. 23.

ROBINIA PSEUDACACIA.

The inner bark of this our common locust tree, has a sweetish and slightly acrid taste, and possesses pretty active powers as an emetic. Its operation is generally prompt and mild. An infusion made of an ounce of the bark to a pint of water may be taken in doses of a small wine-glassful every ten minutes, until vomiting is produced. I have known it to be employed with as much advantage as is usually obtained from the ipecacuanha. It is said to be particularly useful in the early stage of dysentery, when given in under doses, so as merely to excite nausea, or but slight vomiting.

SULPHAS CUPRI.—SULPHATE OF COPPER.—BLUE VITRIOL.—BLUE COPPERAS.

This salt occurs in the form of rhomboidal prisms of a deep blue colour, having an exceedingly harsh and styptic taste. When exposed to the open air, the crystals slightly effloresce on the surface; and when heated they first melt in their water of crystallization, and then dry into a white opaque mass. If the heat be now increased, this white substance "next undergoes the igneous fusion, and finally, at a very high temperature, loses its sulphuric acid, leaving a peroxide of copper." The alkalies, and their carbonates, sub-borate of soda, acetate of ammonia, tartrate of potass, muriate of lime, nitrate of silver, sub-acetate and acetate of lead, chloride of mercury, all astringent vegetable infusions and tinctures, decompose it and alter or destroy its effects. Ammonia throws down from the aqueous solution of

this salt, a bluish-white precipitate of hydrated peroxide of copper, which is immediately dissolved by an excess of the ammonia, forming a beautiful, transparent deep-blue solution, known by the name of *aqua sapphirina.*

This salt consists of one portion of peroxide, with two portions of sulphuric acid, constituting therefore, a bi-sulphate of the peroxide. It dissolves in four parts of water, at the temperature of 60°, and in less than two, at the boiling point. It is not soluble in alcohol.

The operation of blue vitriol, as an emetic, is very prompt, but its impressions upon the general system appear to be much less powerful and extensive than those of the other articles of this class. When taken into the stomach it very speedily excites strong efforts at vomiting: and though the agitation of the body which it creates is very considerable, yet its impressions seem to be a good deal confined to the stomach, since, neither during the operation, nor after it, does the patient experience that distressing relaxation, and general prostration which is occasioned by the other emetics.

As an emetic, this remedy has been very little employed, except in phthisis pulmonalis. Dr. Marryatt* appears to have been the first who used the sulphate of copper in this way. He recommends it to be given in union with tartar emetic, in doses of little more than two grains of each, two or three times a week. Nothing is to be drunk during its operation, and hence he calls it the dry vomit. When diarrhœa attends, he gives one grain of the sulphate of copper with five grains of ipecacuanha.

In a paper on phthisis pulmonalis, published in the first volume of the Transactions of the College of Phy-

* Therapeutics; or, the Art of Healing, 21st edition, 1806.

sicians of Philadelphia, Dr. Senter declares that he "has restored more persons labouring under hectic fever from glandular suppuration, by vomiting every second or third day with the sulphate of copper, and giving, in the intervals, as much as the stomach would bear of Dr. Griffith's myrrh mixture, than by all other methods he has ever tried." He considers this preparation of copper, when united with ipecacuanha, as one of the safest and most efficacious emetics we possess. Dr. Thomas* also adds his testimony in favour of the good effects of this practice. He says that he has adopted it in the treatment of many cases of incipient phthisis "with infinite advantage." Dr. Samuel Fort Simmons† likewise speaks very favourably of this remedy in consumption.

That considerable advantage may, at times, be obtained from this practice, in incipient catarrhal consumption, is very probable; but of its powers to restore persons to health who are "labouring under hectic from *glandular suppuration*," is a point, at which we may well demur. Formerly, there was but little attention paid to the diverse pathological conditions upon which consumptive symptoms may depend; and all cases attended with cough, slow fever, and a puruloid expectoration, were regarded as instances of phthisis pulmonalis from ulcerative suppuration of the glands or pulmonary structure. It is now well known, however, that a large proportion of the cases usually regarded as phthisis pulmonalis, do not depend on scrofulous or tubercular disease of the lungs, but frequently on a chronic state of inflammation of the mucous membrane of the bron-

* Modern Practice.

† Practical Observations on the Treatment of Consumption. London, 1780.

chia; and it is not improbable, that the cases which yielded to this practice, have, for the most part, been instances of this form of pulmonary affections.

I have known great benefit to result from emetic doses of this salt in protracted cases of diarrhœa. In one instance of this complaint, of more than two months continuance, the exhibition of three grains of the sulphate of copper, with six grains of ipecacuanha, every fourth day, effected a complete cure, after various other modes of treatment had been ineffectually employed.

When this preparation is taken into the stomach in excessive doses, it acts as a strong poison, producing pain in the throat, stomach, and intestines, accompanied with violent vomitings, "fœtid eructations, hiccup, difficulty of respiration, and almost suffocation; the pulse becomes small, hard, and accelerated, and in certain cases it may be said to vibrate under the finger like catgut. An inextinguishable thirst, difficulty of making water, cramps, the extremities of an icy coldness, horrible convulsions, general decay of strength, the features of the face changed, delirium—death." To counteract these effects, it has been found that the white of eggs, beat up with water, is the best remedy we possess. Sugar is also useful, and by many has been highly praised as an antidote to this poison. Orfila admits the propriety of its employment, but he says it is not a counter-poison. "Liver of sulphur, the alkalies, gall-nuts, Peruvian bark, charcoal, &c. considered as counter-poisons, are useless, often dangerous, and ought, therefore, to be banished."*

In the dose of from two grains to five, this article acts as a prompt emetic; from one-eighth to one-fourth of a grain, it operates as a tonic.

* Orfila.

The subsulphas hydrargyri flavus, or turpith mineral, is the most active and prompt emetic of the mercurial preparations. It was, at one time, a good deal employed as an emetic, but is now almost entirely neglected, on account of the violence of its operation, and its aptness, sometimes, to excite salivation. It has been recommended for the cure of virulent gonorrhœa, and hernia humoralis, in which affections it has been said to act beneficially, both as a mercurial and an emetic. In leprous diseases, it has also been employed with advantage, particularly when they affect robust constitutions. It has likewise been administered with good effects in putrid sore-throat, croup, and in peripneumony.

It is given in the dose of from two grains to six or eight. Given in smaller doses, it acts as an alterative and diaphoretic. Dr. Hope, senior, states that it forms an excellent errhine when mixed with powdered liquorice-root.

The *corrosive sublimate* has also been employed with a view to its emetic effects. Its use, however, for this purpose, has been properly abandoned, from its violent dangerous effects.

The following indigenous plants possess useful emetic powers—all of which have been recommended and employed as substitutes for ipecacuanha, for the purpose of exciting emesis:

1. *Celastrus Scandeus*—staff-tree. A strong decoction of the bark (an ounce of the bark to half a pint of water) given in table-spoonful doses every fifteen minutes, excites active vomiting.
2. *Dirca Palustris*—leather-wood; moose-wood. The bark of the root is

employed. Dose from five to ten grains. Recommended in asthma and intermittents.

3. *Sanguisorba Canadensis*—burnet saxifrage. The root is used. Dose from ten to twenty grains. It is an excellent emetic, and may in most instances be used instead of ipecacuanha, without any disadvantage.
4. *Trillium Cernuum*—drooping three-leaved night-shade. Possesses pretty active emetic properties. The root is used. Dose from ten to fifteen grains every twenty minutes, until vomiting is excited.
5. *Eupatorium Perfoliatum*—boneset, thorough-wort. A strong decoction of the leaves and flowers of this plant, when taken in wine-glassful doses, every ten or fifteen minutes, produces free and copious vomiting, and strongly excites the cutaneous exhalents. In the initial stage of catarrhal and pneumonic affections, a free use of a decoction or infusion of this plant, so as to excite emesis, often procures speedy and complete relief.
6. *Erithronium Americanum*—dog's-tooth violet, adder's tongue. All the parts of this plant are active. In the dose of from twenty to thirty grains, it acts as a mild emetic. It has been recommended as a peculiarly beneficial emetic in the commencement of dysenteric affections.
7. *Euphorbia Corollata*—corollated spurge. The emetic properties reside chiefly in the cortical portion of the root. In the dose of from ten to fifteen grains, it excites active vomiting and protracted nausea.
8. *Apocynum Canabinum*—Indian hemp. The root of this plant is powerfully emetic. It produces great and protracted nausea, and generally diminishes the frequency and fulness of the pulse to a very conspicuous degree. It appears, moreover, to possess narcotic properties, since its emetic operation is invariably followed by drowsiness. In doses not sufficient to excite immediate vomiting, it operates as a powerful hydrogogue cathartic. It has been used in dropsy, with entire success, by Dr. Parrish.*
9. *Apocynum Androsæmifolium.* The root, given in the dose of from twenty-five to thirty grains, is a certain and mild emetic. It is a good substitute for ipecacuanha.
10. *Robinia Pseudacacia*—common locust tree. The bark of this tree operates as a mild and certain emetic. An ounce of the green bark boiled in three gills of water, down to half a pint, and given in tablespoonful doses, every ten minutes, will excite free and gentle vomiting.

* Inaugural Dissertation. By M. L. Knapp, M. D.—American Med. Review. Philada. vol. iii. p. 197.

CHAPTER III.

CATHARTICS.

Cathartics are medicines which evacuate the contents of the intestines downwards, or which, when given in proper doses, produce purging.

As, in many parts of the intestine tube, its contents are carried forwards in a direction contrary to their gravity, a very considerable propulsive force, it is evident, must be pretty constantly exerted downwards, in order that the alvine evacuations may be regularly effected. This force consists in that series of contractions of the muscular fibres of the intestinal canal from above downwards, called peristaltic motion. Constipation must, therefore, depend either upon a cessation, or an inadequate force of this peristaltic action, or upon some mechanical resistance to its propulsive power, or upon both these causes combined.

Whatever, therefore, increases the alvine discharges, acts either by increasing the peristaltic action of the bowels, or by removing the impediments which oppose its regular propulsive action, or by both these effects.

It is in this latter way that cathartics produce their evacuant effects; for, while they excite the peristaltic or propulsive action of the intestinal canal, they also augment its natural secretions. They thus at once increase the force of the propelling power, and diminish the resistance of the substances propelled, by lubricat-

ing the internal surface of the bowels, and attenuating their contents by the increased secretions they produce.

Independent of the different degrees of evacuant power which these remedies possess, they differ also essentially from each other in relation to the particular parts of the intestinal tube upon which they more immediately exert their actions. Thus gamboge, calomel, and a few others, direct their action more particularly upon the upper portion of the intestines; whilst aloes acts almost entirely upon the lower portion of the bowels. With regard to the nature and appearances of the evacuations produced by the various articles of this class, the diversity is equally remarkable. Jalap, colocynth, elaterium, gamboge, and the saline purgatives, for instance, produce copious *watery* discharges; castor oil, rhubarb, senna, and sulphur, merely evacuate the contents of the bowels; whilst others, as calomel, increase the secretion of the bile, and carry off this fluid in augmented quantities. It is not improbable, as Dr. Paris observes, that the diversity which exists in relation to the part of the intestinal tube upon which different purgatives act, is owing to the different degrees of "the solubility of the active elements" of these remedies. "It is, for instance, easy to conceive," says this writer, "that a medicine may act more immediately and especially upon the stomach, small or large intestines, according to the relative facility with which its principles of activity enter into solution; that those which are dissolved before they pass the pylorus are quick and violent in their effects, and liable to affect the stomach, as is exemplified by the action of *gamboge*, &c. whilst some resinous purgatives, on the other hand, as they contain principles less soluble, seldom act until they have reached the colon. *Colocynth* has a wider

range of operation, since its principles of activity reside both in soluble and insoluble elements. *Aloes*, again, being still further insoluble, pass through the whole alimentary canal before they are sufficiently dissolved, and act, therefore, more particularly upon the rectum." A knowledge of these circumstances is of very great consequence, both in a therapeutic and pharmaceutical point of view. For it will not only enable the practitioner to modify the peculiar action of these remedies, by changing the degree of their solubility, but also to select those articles which are thus peculiarly adapted to the particular circumstances of the diseases for which they are prescribed. Thus, in *ascites*, we would be naturally led to employ those purgatives that have a more especial tendency to excite serous evacuations; whilst in cases attended with redundancy or vitiated bile, we would resort to such as act particularly upon the upper portion of the bowels, and at the same time influence the functions of the biliary system. Again, if, in addition to the mere effect of unloading the contents of the bowels, we wish also to produce a determination to the pelvic viscera, to the uterus, for instance, in amenorrhœa, we select *aloes* as the appropriate purgative, because of its more particular action on the rectum.

Besides the more immediate operation of evacuating the contents of the bowels, cathartics produce other effects on the animal economy, to which no small part of their remediate powers may, with reason, be ascribed.

1. They diminish the action of the heart and arteries, and are, therefore, of more or less advantage in all diseases of a sthenic character. They produce this effect not only by evacuating the vitiated or accumulated contents of the bowels, and thereby removing a source

of general irritation, but also, by abstracting from the contents of the blood-vessels, by the increased secretion of serum they produce from the intestinal exhalents. In this respect, the operation of these remedies resembles, in some degree, that of blisters; which, though acting primarily as stimulants upon the sanguiferous system, reduce its action, as a secondary effect, by the evacuation of serum which they occasion.

2. They promote the absorption of fluids from the internal cavities. This effect they produce by a twofold operation; namely, by depriving the blood-vessels of a portion of their serous contents, and by augmenting, as a consequence of this, the reabsorption of serum from those cavities in which it may exist in a state of morbid accumulation. To render this explanation intelligible, it will be necessary to enter into a more particular exposition of the grounds upon which it rests. It appears to be conclusively established, both by direct experiment* and pathological observations, that absorption is accelerated in proportion as the quantity of fluid circulating in the blood-vessels is diminished. It would appear, too, that there is a constant effort in the system to preserve the regular proportion of serum in the blood, and that its inordinate loss by one emunctory, is counterbalanced either by a greater absorption from some of the internal cavities, in which it may be accumulated, or by the diminished action of one or more of the other serous emunctories. Thus, when the exhalents of the peritoneum effuse a preternatural portion of serum into the cavity of the abdomen, producing ascites, the morbid diminution of this fluid in the blood-vessels is, in some degree, counteracted by the *diminished* action of the cutaneous exhalents, and of

* Journal of Experimental Physiology, by M. Magendie, 1821.

the kidneys. The moment, however, that the kidneys are excited into a more perfect performance of their functions, then (this check to the morbid diminution of the serum of the blood being removed) some new supplying power is requisite to keep up the necessary proportion of serous fluid in the blood-vessels; hence the absorbents are called into action, and the dropsical fluid is reabsorbed into the circulation, and thence thrown off by the regular emunctories. From these facts, we readily perceive the way in which active cathartics promote the absorption of dropsical effusions. By irritating the exhalents of the internal surface of the intestines, a greatly increased secretion and loss of serum is suddenly produced by the action of these remedies. As a consequence of this, not only is the further effusion of dropsical fluid diminished by deriving the blood from the exhalents of the cavities to those of the intestines, but its existing quantity is also directly lessened, by the absorbents assuming a more vigorous action, in order to supply the deficiency which the purging has suddenly induced in the serous portion of the blood. This view of the subject will aid us, I think, in accounting for the fact mentioned by Dr. Paris, and others, that cathartics often increase the effects of diuretics. If, for instance, we give a diuretic to a dropsical patient, a slight, but insufficient increase of urinary secretion, for the most part, follows; the absorption is, of course, proportionally small. Let a cathartic be now administered. This will excite a sudden and considerable increase of serous evacuation by the bowels; hence, an unusual demand for a restitution of this constituent portion of the blood is created; and, by consequence, a new impulse given to the supplying or absorbing vessels; which, continuing *after* the opera-

tion of the cathartic has ceased, will have the effect of supplying the kidneys with a larger portion of the elements of their secretion, and, therefore, enable those medicaments which are calculated to increase their action, to operate more effectually.

3. Cathartics tend to remove the torpor which sometimes prevails in the portal circulation, and thereby to promote the biliary secretion. This they do by exciting "a brisk peristaltic motion of the intestines, whereby the blood, which is accumulated, and as it were stagnated in the portal circle, is propelled forwards."*

4. They produce a powerful derivation of the circulation from the superior to the inferior parts of the body, on the principle of *ubi irritatio ibi afluxus;* and hence their utility in cephalic diseases.

5. They doubtless, also, often produce a new excitement in the nervous system, independent of their evacuent effects, and thereby weaken or interrupt the train of morbid sympathies, or counteract the morbid excitement of certain organs and structures.

It may be observed, that, under particular circumstances, bleeding increases, very considerably, the susceptibility of the intestinal canal, to the operation of cathartic medicines. "I have often noticed this fact," says Dr. Paris, "in contending with a plethoric diathesis; whenever the bleeding preceded the purgative, the effects of the latter have been uniformly more speedy and considerable; in obstinate constipation the same fact has been observed, and mild remedies have been known to act more powerfully, when preceded by blood-letting, than potent ones have when exhibited antecedent to it." When torpor of the bowels depends on a congested state of the cerebral blood-vessels, a

* Johnson on the Diseases of Tropical Climates.

circumstance often noticed in hydrocephalus, and other cephalic diseases attended with a preternatural determination of blood to the brain, the operation of purgatives may, generally, be much promoted by the application of ice or very cold water to the head and sinapisms, or fomentations to the feet, after adequate blood-letting.

Having premised these general observations, I pass on to a more particular account of the practical application of this class of remedies. There is no class of remedial agents belonging to the materia medica, whose application is more extensive, or whose aid is more essential to the medical practitioner, than this one. In almost every variety of febrile disease, purgatives are among the most useful curative means we possess. The alimentary canal has been, not unaptly, called the "storehouse of diseases." Whatever may be the original febrile cause, whether seated in the bowels or elsewhere, it is certain that the secretions which are poured into the alimentary canal are, perhaps, in almost every instance of fever, changed from their natural or healthy condition, to a state which renders them additional causes of irritation, to the already preternaturally excited system. Hence, simply with a view to remove these additional supporters of febrile action, purgatives are important throughout the whole course of acute diseases. It is, however, not merely by evacuating the vitiated and irritating contents of the bowels, but, also, by their direct depletory effects on the sanguiferous system, and their consequent power of reducing arterial excitement, that purgatives are beneficial in febrile diseases.

Although purgatives are unquestionably highly useful in every form of fever, yet it must not be forgotten,

that in all febrile affections there exists a considerable tendency to inflammation of the mucous membrane of the alimentary canal; and that, consequently, no small degree of injury may be done, by too frequent a use of active cathartics. This observation applies more especially to the advanced stages of catarrhal and bilious fevers; for, when these forms of fever become protracted, more or less inflammation is almost always developed in the internal coat of the stomach and bowels. In general, the more active articles of this class of remedies should be rejected, in all febrile diseases where there is a probability that frequent purgation may become necessary for removing the vitiated contents of the bowels. Without adopting the pathology of Broussais, I am yet entirely convinced that purgatives are often exceedingly abused in the treatment of fevers. It is in vain to deny that gastro-enteritis does, very frequently, occur in fevers, and it matters little whether it be secondary or primary, for in either case the irritation produced by the frequent use of *active* cathartics must almost inevitably prove injurious.

Not long ago, I met with an instance (in consultation), of the most lamentable abuse of cathartics in a case of fever, apparently excited by checked perspiration from cold. The patient, when I first saw him, had already been sick about ten days. I was told by the attending physician, that there had not been the slightest remission for six days, notwithstanding the daily employment of "*very active*" cathartics. For four days in succession the patient had taken senna and manna, calomel and jalap, and salts; and on the morning when I saw him he had already swallowed a full dose of rhubarb. I found the patient lying on his back, slightly delirious, his knees constantly drawn up, the tongue

dry and brown in the middle, and deep red at the tip and edges, and the abdomen tumid, tense, and exceedingly tender to the touch. He died in two days after. Whenever the tongue is red and granulated along the border, or red, smooth, and glassy over the whole surface, with a tender, tumid, and tympanitic state of the abdomen, and watery flocculent stools, nothing can be more injurious than the administration of active cathartics. The longer I practice, the more I become convinced that the *milder* laxatives are decidedly preferable to the more active articles of this class in fevers; and except in the very commencement, where there is reason to believe that the bowels are in a loaded condition, it will always be advisable to abstain from energetic or irritating purgatives.

Typhus fever having been long considered as essentially characterized, *ab initio*, by debility, purgatives were, of course, almost universally held as improper in its treatment, until Dr. Hamilton, of Edinburgh, pointed out their utility in his estimable work on purgatives. That they are, in fact, not only safe, but eminently useful, in the management of this form of fever, where there are no signs of gastro-intestinal inflammation, is now sufficiently established by the concurrent testimony of the ablest practical writers of the present day. Dr. Rush long since observed, that purgatives are often found to remove, in a sudden and remarkable manner, the *apparent* debility which frequently exists in the latter stages of acute diseases. In the yellow fever he often saw the prostrated strength of a patient suddenly renovated by the operation of a single purgative. That great debility is often produced by the impression of irritating matters on the intestinal nerves, is a fact too frequently witnessed to admit of a moment's doubt.

Who has not seen the impressions of indigestible food, in persons of debilitated digestive organs, bring on the most alarming prostration? Why do we so strenuously restrict our debilitated convalescents from taking food, which, in health, would be deemed altogether insufficient to sustain the natural powers? . It is because we fear, and justly too, lest it either prostrate the already debilitated vital energies, or raise a tumult in the system dangerous to life. If the natural ingesta are thus able to affect the animal economy, when not fortified by strong digestive powers, is it not reasonable to expect pernicious consequences from the retention and irritating impressions of the vitiated matters, on the intestinal nerves of the debilitated typhus patient? That the contents of the intestines are more or less vitiated in all febrile diseases, and especially in low typhus fever, is evident, I think, not only from the actual appearance of the discharges themselves, but also from the necessary results of the suspended digestion and morbid intestinal secretions which occur in those fevers. From this view of the subject, therefore, we can readily perceive the utility of employing mild *laxatives* in the latter stage of typhus fevers; since we thereby free the system from a powerful cause of irritation, and at once renovate the vital powers, and enable the intestinal emunctories to recover their natural functions. "I have directed a strict attention," says Dr. Hamilton, "to this practice for a long time, and I am now thoroughly persuaded that the full and regular evacuation of the bowels relieves the oppression of the stomach, cleans the loaded and parched tongue, and mitigates thirst, restlessness, and heat of surface; and that thus the latter and more formidable impression on the nervous system is prevented; recovery more certainly and

speedily promoted, and the danger of relapsing into the fever much diminished."* These observations apply particularly to the latter stages of typhus, for, in the commencement of this disease, when vascular excitement is pretty active, *active* purgatives will be beneficial, both by unloading the bowels of their irritating contents, and by their direct depletory effects on the blood-vessels.

In relation to the modus operandi of purgatives in typhus, Dr. Armstrong† makes the following remarks, which, though doubtless correct, do not, as this respectable writer would seem to think, invalidate the foregoing remarks concerning the mode in which these medicines produce their good effects in this disease. "Purgatives seem beneficial by unloading the intestines of fæces and excrementitious matters, which, when retained, excite and keep up much general irritation. But is it not exceedingly probable, that they have another *and far more salutary effect, in restoring healthy secretion, and in removing irregular distributions of blood from the head, liver, and other parts?* The full operation of aperients sometimes reduces the morbid heat of the skin and the morbid force of the pulse, almost as effectually as the affusion of cold water or venesection; consequences which surely indicate that their action extends further than the mere removal of fecal matter from the intestinal canal." It cannot, indeed, be denied, that the consequences here mentioned do sometimes follow the operation of cathartics: but when we reflect that the very circumstances of a hot and dry skin, an irritated pulse, morbid function of the intestinal exhalents, and irregular distributions to the head, liver, and other

* Hamilton on Purgatives.

† Treatise on Typhus Fever, p. 102. First Am. edit.

vital parts, are in reality often produced by irritating matters lodged in the intestines, it seems evident, that these symptoms may be mitigated by mild laxatives, not by any operation independent of their mere evacuant effects, but solely by removing those irritating matters from the bowels, upon which the morbid phenomena just mentioned depend.

Dr. Armstrong makes another observation on this subject, to the reasonableness of which I readily subscribe. "I believe," says he, "that purgatives are also beneficial by preventing, through their operation, the absorption of the morbid secretions and excrementitious matter of the intestines; for when these have been allowed to be retained in typhus, I have generally observed a considerable increase of irritation, with an offensive odour from the lungs and from the skin; and, on the contrary, when the morbid secretions and excrementitious matter have been regularly evacuated, there has mostly been a diminution of irritation, with an absence of this peculiar odour."

I have already said that *some* purgatives excite the intestinal exhalents, producing copious *watery* stools, and causing thereby a very considerable reduction of vascular action, whilst others appear to do little more than merely to evacuate the contents of the bowels. This circumstance should be always kept in mind when prescribing purgatives in typhus. For while cathartics of the former kind may answer well in the first stage of the disease, they are, undoubtedly, less proper in its advanced stages than the milder laxatives, when our object is, in general, merely to unload the irritating contents of the bowels, with as little reduction of the vital powers as possible.

In all the exanthematous fevers, purgatives are very

useful remedies. Their beneficial operation in these diseases would seem to depend chiefly on their power of determining the circulation from the cutaneous to the intestinal capillaries. That the exanthemata are peculiarly characterized by strong morbid excitement in the cutaneous vessels, is perfectly obvious from the manifest character of these diseases. It would, therefore, appear reasonable, *a priori*, to suppose, that whatever is calculated to moderate the action of the vessels of the surface, is by this effect equally calculated to moderate the characteristic symptoms of these diseases. It is upon this principle that cold air and tepid ablutions act so beneficially in affections of this kind. It is chiefly during the eruptive fever that purgatives are especially useful in diseases of this kind. After the eruption is completed, it will be best to keep the bowels open by the gentlest aperient remedies, or by the regular employment of laxative enemata. Experience has taught us, that an increased action of the vessels of the intestines, or an afflux of blood to these organs, is almost invariably attended by a simultaneous diminution in the action of the extreme vessels of the cuticular surface, or, in other words, by a partial desertion of the blood from these vessels, and *vice versa*. Hence, sudorifics are useful in checking intestinal fluxes; and hence, too, cathartics, by exciting intestinal exhalation, act beneficially in the exanthematous fevers. Undoubtedly, however, something is also to be ascribed to the mere removal of the irritating contents of the intestines, and to the *general* reduction of arterial excitement, which these remedies occasion.

In the early stage of scarlatina simplex and anginosa, purgatives are of essential service. Their utility in this disease has been particularly dwelt on by Dr.

Hamilton, in his work on purgatives; and Dr. Armstrong adds his testimony in favour of this practice—a practice which is, indeed, pretty universally recommended at the present day. In order to derive the full advantage of purgatives in this affection, it is necessary to produce *brisk* and copious evacuations. For, if the views just given of the modus operandi of purgatives, in affections of this kind, be correct, it is evident that such cathartics as act *briskly* upon the bowels, must be most efficacious in this disease. Dr. Armstrong recommends the employment of sulphate of magnesia, with tartrate of antimony, with the view of exciting rapid purging and vomiting. The same observations apply to the use of purgatives in erysipelas.

In no disease are laxatives more decidedly beneficial than in dysentery. Such is the tenderness of the inflamed intestinal canal in this disease, that even its ordinary contents become a source of great and painful irritation. One of the first steps, therefore, in its treatment, is to remove these irritating matters by the employment of such purgatives as will produce a speedy and full action on the bowels; and, as the secretions which are poured into them are, perhaps, in all instances in a vitiated state, these remedies must be occasionally employed throughout the whole disease. As our principal object, however, is to remove those substances from the bowels which have a tendency to irritate, it is obvious that our purpose will be best answered by such purgatives as will evacuate them with the least possible irritation. It is, therefore, of considerable consequence to select such aperients as are least harsh in their operation, though sufficiently active to induce free evacuations.

Cathartics are highly useful in puerperal fever and

peritonitis. Active purging in the onset of these diseases, is, indeed, sometimes sufficient, without any other aid, effectually to arrest their progress. Used in conjunction with decisive venesection, purgatives constitute the only remediate measures upon which any particular reliance deserves to be placed. There is generally much difficulty in moving the bowels in these affections, and we must, therefore, employ strong doses of the most active of these remedies.

I am decidedly of opinion, both from theoretical considerations and practical observation, that the benefit resulting from purgatives in these diseases will, in general, be proportionate to the activity of their operation. Drs. Abercrombie* and Broussais are of opinion that purgative medicines are injurious in peritoneal inflammations. The latter writer observes, that these remedies are hurtful, "because the vermicular contractions which they excite in the intestines, must increase the morbid sensibility of the peritoneum." The following observations of Dr. James Johnson upon this subject, appear to me to be highly judicious. "In abdominal inflammation, provided the *mucous* tissues are not inflamed, purgative medicines excite the secreting vessels, not only of the whole internal surface of the intestines themselves, but of the glandular organs whose excretory ducts open into the primæ viæ, and thus powerfully deplete *locally* the vascular system of the abdominal viscera. When the portion of peritoneum reflected over the intestines is inflamed, but where the villous coat is unaffected, I hesitate not to assert, from personal experience, that constipation of the bowels will, in nine cases out of ten, be a feature of the disease;

* Researches on the Pathology of the Intestinal Canal, in the 63d number of the Edinburgh Medical and Surgical Journal.

and in such cases we maintain, that to excite the natural action of the mucous membrane, immediately after proper vascular depletions, is a powerful mean of checking the peritoneal inflammation; in the same way that a free expectoration from the mucous membrane of the lungs relieves the vascular turgescence and inflammation of the parenchymatous structure or pleural covering of the same organ."*

Dr. Marshall Hall gives an account of a disease peculiar to puerperal women, resembling very closely genuine puerperal fever, in which purgatives followed by opiates would appear to be the only remedies offering any prospect of success; and in which bleeding, according to his experience, is almost certainly fatal. Dr. Hall's description of this disease, as distinguishable from puerperal fever, properly so called, is, however, by no means satisfactory. He has pointed out no marks by which it may be discriminated from this latter disease; there can, however, be no doubt, that great prostration of the vital powers, pain, and arterial excitement, may sometimes arise from intestinal irritation in puerperal women, without the existence of any local abdominal inflammation; and under such circumstances we can readily perceive, that bleeding, especially if copious, would be improper, since it would create additional debility without removing the cause of irritation, which would, indeed, by this very practice, become more pernicious in its effects. The phenomena which distinguish these cases from puerperal fever, are the following: The countenance is pale, contracted, and expressive of great distress and exhaustion; the extremities are cool, or about the natural grade of temperature; there is great restlessness, the arms and legs being constantly

* Medico-Chirurgical Review, No. 2. Analytical series.

moved from place to place; the patient complains of a sense of great prostration and sinking; the respiration is short, irregular, and interrupted by deep sighing; a feeling of faintness is felt on raising the head from the pillow; the pulse is usually small, frequent, and sharp; a sense of uneasiness and distress is often experienced in the region of the stomach; the alvine evacuations are commonly thin, frothy, of a pale yellow or ash colour, resembling yeast.

From the general antiphlogistic operation of cathartics, it is evident that they are not inapplicable in the treatment of acute rheumatism. They are, in fact, much recommended in this disease by writers of great respectability. "The advantage," says Dr. Scudamore, "of making a detraction from the general circulation by the channel of the alimentary canal, is no less remarkable in rheumatism, than in every other inflammatory disease. In proportion as we pursue this practice upon a continued principle from day to day, do we obtain its good effects in acute rheumatism; the circulation becomes moderated, the inflammatory diathesis subdued, and the absorbent system is excited to increased action. Hence, we powerfully promote the removal of those excessive secretions of the synovial membranes, which have been already described as causing the distention and impeding the motion of the affected parts. A saline purgative, administered in small doses, and at repeated intervals, is the most advantageous."* Drastic purges are, however, as a general rule, not to be employed in the treatment of this disease. These are, in some degree, incompatible with that regular action of the cutaneous exhalents which seems to be indispensable to the removal of this painful

* A Treatise on the Nature and Cure of Gout and Rheumatism.

affection. Laxatives, on the contrary, are of unquestionable service; they remove the sources of intestinal irritation; tend to equalize the circulation, and to lessen the action of the heart and arteries, by their evacuant effects upon the extreme vessels of the intestines. As auxiliaries to other antiphlogistic measures, they can seldom be neglected with propriety, in the cure of acute rheumatism. Nearly the same thing may be said in relation to the use of cathartics in the treatment of gout. Whatever be the real nature of this disease, it seems certain that there is, perhaps, always more or less functional derangement of the secretory organs of the alimentary canal, and especially of the liver and portal system of vessels.* There is no difficulty, therefore, in accounting for the beneficial operation of purgatives in gout. They not only remove the vitiated and irritating contents of the bowels, but tend also to correct the action of those glands whose products are poured into the alimentary canal, and by detracting from the general circulation, to moderate the febrile excitement, and especially to promote and invigorate the portal circulation, which, according to Scudamore, is in a congested condition.† Dr. Sutton, in his Tracts on Gout, &c. speaks strongly in favour of the employment of cathartics in this disease. Dr. Scudamore states, that "he has invariably employed, with the greatest advantage, purgative and diuretic medicines conjointly, so that the exhalent vessels of the alimentary canal, and the secreting function of the kidneys are stimulated to increased action at the same time." Such a union of purgatives and diuretics is particularly serviceable in those cases that are attended with dropsical effusions in the extremities.

* Dr. Scudamore on Gout, p. 74.

† Ibid. p. 100.

In *pneumonic inflammation*, cathartics have not, in general, been regarded as particularly useful, except merely for the purpose of discharging the fæculent contents of the bowels. In the early and active stage of the disease, however, free purging is often decidedly beneficial; but after expectoration has been fully established, active and repeated purging seldom fails to do injury by debilitating the system and checking the bronchial secretions.

In the initial stage of *croup*, one or two brisk purgatives are frequently attended with great benefit. In the advanced stage of the complaint, however, rapid purging only tends to exhaust the vital energies, without making any favourable impression on the tracheal affection.

There is no acute disease in which purgative medicines are more indispensable than in acute hydrocephalus. The pathology of this complaint has, of late years, been much elucidated. It appears now to be pretty generally admitted, that it often depends on intestinal irritation. The alvine discharges, in this disease, often afford unequivocal proof of great functional disorder of the liver. They frequently consist of large quantities of black, or green and glairy bile, and seldom, if ever, exhibit the appearance of natural and healthy fæces. In post mortem examinations of hydrocephalic children, Dr. Cheyne "found in the liver, the remains of great inflammatory action, and also proofs that undue irritation had existed in the alimentary canal."* And Mr. Abernethy† states, that on dissecting the body of a child that had died of "unequivocal symptoms of hydrocephalus," he found the brain per-

* Cheyne on Hydrocephalus.

† Surgical Observations, part ii. p. 190.

fectly healthy, *the only diseased appearance being in the bowels.* Dr. Cheyne also mentions the case of a girl, who, complaining in the evening of headache, was put to bed by her mother, and was soon asleep; next day, at noon, she was still sleeping profoundly, respiring fully and slowly, with now and then a heavy sigh; the eyes were fixed, the pupils large and immovable. She had been very costive for some days previous, and was languid; she was ordered an enema, and this roused her so far as to swallow a bolus of jalap and calomel. This operated powerfully, and brought away "two chamber-potfuls of the most extraordinary collection of fæces" the doctor ever saw. The patient recovered immediately. This case shows, in a striking manner, the powerful influence which intestinal irritation, from acrid or vitiated matters, may have upon the brain. We have a further confirmation of the correctness of this pathology of hydrocephalus, in the fact, that cholera infantum very often terminates in unequivocal symptoms of hydrocephalus. Nor is it an uncommon thing to see children who have long been harassed with indigestion and diarrhœa, die with symptoms of hydrocephalus acutus. Indeed, proofs of the morbid influence of visceral irritations on the brain are so various and palpable, that the most careless observer must have often noticed them.*

But, whether the disease be an idiopathic, or only a secondary affection of the encephalon, purgative medicines are amongst the most important of our remediate resources. It is evident, however, that where the disease is dependent on a primary irritation in the bowels,

* This pathology of hydrocephalus is particularly advocated by Drs. Cheyne and Yates. Spurzheim thinks that the disease is sometimes dependent on primary gastric irritation, but that it is generally an idiopathic cerebral affection.

cathartics are more especially indicated, since they tend, at once, to remove the remote cause of the disease, and by determining an afflux to the intestines, to lessen the flow of blood to the brain. The bowels should, therefore, be actively moved, in every instance where hydrocephalic symptoms supervene, whatever other measures be adopted. They have a more powerful effect in lessening the action of the circulation in the head, than any other internal remedies we can employ. "Should we ascertain," says Dr. Cheyne, "that the alimentary canal is torpid, and imperfectly performing its functions, admitting an accumulation of fæculent matter, or that the secretions flowing into it are vitiated or diminished in quantity, which we discover by the peculiarity in the appearance, or the pungent fœtor of the stools, we must, by steadily pursuing the purgative plan, endeavour to effect a change; for while this is produced in the appearance of the stools, by the stimulating quality of our medicines, we are effecting a most important change in the hepatic system, alimentary canal, and all the parts, including every organ essential to life, which is connected with them."*

For the same reason that purgatives are prescribed in hydrocephalus, namely, to determine the circulation from the head, and to remove the causes of intestinal irritation, are they useful in apoplexy. Whatever speculative notions may be entertained in relation to the pathological character of this disease, all experience testifies in favour of the employment of active cathartics in its cure. As the advantages derived from these remedies, in the present disease, arise probably chiefly from the strong tendency they have to diminish the

* Essays on the Diseases of Children, by John Cheyne, M. D.

afflux of blood to the encephalon, and directing it upon the intestines and other gastric viscera, it is evident that the more rapidly they purge, the more beneficial will be their operation in this malady.

Hypochondriasis is, in general, obviously connected with and often preceded by a deranged state of the chylopoietic viscera. We may frequently trace the successive grades of dyspepsia up to the full formation of this deeply distressing complaint. It is almost invariably preceded by disorder of the digestive organs. The appetite is either morbidly increased or depressed; a distressing sense of fulness is experienced in the stomach, and there are fœtid eructations, with a white tongue, obstinate constipation, and headache. Yet in this disease *active* purging does not appear to be proper; for, as the gastric symptoms just mentioned, and upon which those of the mental affection would seem to depend, arise from a fixed inflammatory *irritation* of the mucous membrane of the stomach and bowels, it is easy to understand why drastic purgatives rather do harm than good. For, although they might effectually remove the vitiated contents of the intestines, yet, as their operation would have a tendency to irritate still more the already too greatly irritated condition of the mucous membrane of the stomach and bowels, it is evident that they cannot be employed with propriety in this affection. The same objection does not, however, exist against the use of *laxatives* in this disease. These, on the contrary, are indispensable auxiliaries in its treatment. By gently exciting the action of the bowels, they tend to restore the natural intestinal and hepatic secretions, and to remove the torpor which, in this disease, prevails in the portal circulation. Purgatives ought to be united with mild bitter tonics, and given in

such a way as to procure one, or at most but two, good evacuations every twenty-four hours. There is often an amazing quantity of fæcal matter impacted in the lower bowels of hypochondriacs, which has a strong influence in keeping up the disease, and which it is frequently extremely difficult to evacuate by purgatives. When there is reason to suspect the presence of such accumulated contents, there is no way by which we can so conveniently, and at the same time so effectually and beneficially remove them, as by the daily employment of mild and copious laxative injections. These, indeed, should never be neglected in the treatment of this and other chronic diseases, dependent on gastric derangement, and accompanied with intestinal torpor.

Hysteria is a disease closely allied to the preceding affection; and its intimate connexion with disorder of the digestive organs, is demonstrated by the symptoms of wandering pains in the abdomen, flatulence, acid and fœtid eructations and constipation, which characterize the hysteric constitution.* "In my opinion," says Dr. Hamilton, "these symptoms afford conclusive evidence that this gastric affection is primary, and that the other multifarious symptoms of hysteria depend on it. I have, therefore, thought it reasonable to attend particularly to the state of the stomach and intestines, and to employ, in the first place, purgative medicines, to remove the constipation of the body, which most commonly prevails in hysteria." I have been much in the habit of employing purgatives in hysteria. In some instances I have succeeded in putting a stop to the paroxysm by means of a brisk cathartic, after all the ordinary remedies, for cases of this kind, had been tried with little or no advantage. Purgatives will, how-

* Dr. Hamilton.

ever, produce very little benefit in this disease, unless they be administered in doses sufficient to occasion full and active purging. They may be very advantageously united with the fœtid gums, particularly assafœtida. Dr. Hamilton observes, what, indeed, I have myself repeatedly noticed, that "the first purgatives seem, on some occasions, to aggravate the symptoms; but the practice must not be deserted on this account. The additional irritation which purgatives may give in the first instance, soon passes away; and perseverance in the use of them removes that irritation which gave rise to the disease, which, of course, disappears in proportion as the bowels are relieved of the oppressive mass of accumulated fæces." It is evident, however, that in a disease, which, like this one, is so intimately connected with disordered digestive powers, the employment of tonic and gently stimulating remedies will often be found useful along with purgatives.

Chorea is another of the neuroses, in which the employment of purgatives has been especially recommended. That it is often dependent on gastric or intestinal irritation, and connected with great fæcal accumulations in the lower intestines, I have not the least doubt; and that, in such cases, purgatives will be useful is at once obvious. Dr. Hamilton strongly recommends a course of active purgatives for the cure of this affection. He has reported several cases which yielded to the influence of repeated purgatives, without the aid of any other remedy. Sydenham, De Haen, and Stoll, speak very favourably of active cathartics in this malady.

"Chorea," says Dr. Hamilton, "consists of two stages. In the first, while the intestines yet retain their sensibility, and before the accumulation of fæces is great,

gentle purgatives, repeated as occasion may require, will readily effect a cure, or rather prevent the full formation of the disease. In the confirmed stage, more sedulous attention is necessary. Powerful purgatives must be given, in successive doses, in such a manner that the latter doses may support the effect of the former, till the movement and expulsion of the accumulated matter are effected." It is absolutely indispensable to pursue this treatment in a firm and decided way, in order to derive permanent advantages from its employment. "Half measures, in instances of this kind, will prove unsuccessful."

It must be confessed, however, that, although chorea may frequently, perhaps generally, have its origin in the alimentary canal, yet we sometimes meet with cases which do not seem to depend upon causes seated in the abdominal viscera, or which, at least, do not yield to a course of purgative remedies. I have seen two cases in which purging was practised copiously and regularly for a reasonable length of time, with no alleviation, but, on the contrary, with a manifest aggravation of the convulsive motions of the patients. One of these patients was finally cured by tonics and antispasmodics; the other did not recover. I have, however, seen other cases, both in my own practice and in the practice of other physicians, which were effectually cured by the plan recommended by Dr. Hamilton. I am, therefore, fully persuaded, that although this mode of treating the disease will not always succeed, it holds out a more certain and rational prospect of success than any other treatment with which we are at present acquainted.

Respecting the employment of purgatives in the treatment of tetanus, no very satisfactory results have been

obtained. When this disease arises from general causes, or, more properly speaking, when it does not depend on any local mechanical injury, it would seem, from the reports of Drs. Hamilton and Burns, to be occasionally remediable by the vigorous employment of purgatives. In the treatment of *trismus nascentium*, or the locked-jaw of infants, purging has also been successfully employed. Dr. Chalmers says, "I have cured one case of the jaw-falling of infants, by purging with an infusion of rhubarb, to which a few grains of musk and a little *ol. tart. per deliq.* were added."* When once formed, however, this disease of infants is but very rarely cured. I know of no authority for the assertion made by Dr. Chapman, that "the utility of purging is indisputably established in trismus nascentium." A very few solitary cases appear on record, in which this treatment was employed with seeming success; but its utility is far, I am sorry to say, very far from being "indisputably established" in this fatal variety of spasmodic disease.†

* London Medical Observat. and Inquiries, vol. i. p. 109.

† The following observations on spasmodic diseases are quoted by Dr. Hamilton, from Camper's Anatomico-Pathological Demonstrations.

"Nervis descriptis ad symptomata accedo, quæ ex eorum unionibus facile explanatur; Ordiar autem a pedum tremor, qui hystericis familiaris est. In antecessam vere monere debeo, omnia terribilia hysterica symptomata, quæ tum in singulis, tum in universi corporis locis quotidie videmus, ab acrimonia putrida primas vias occupante omnino dependere; excrementorum enim fœtor intolerabilis, fauces, et alia qua præter naturam sunt, rigorum et convulsionum accessum annuntiant. Res igitur ita se habere videtur; plexu mesenterico inferiori affecto, nervi omnes cum eo conjuncti, lumbales, scilicet, et proinde crurales, atque obturatores nervi afficiuntur. Si acrimonia tanta est ut etiam rectum intestinum irritare queat, nervi Ischadici in concensum trahentur, rigebitque pes integer, concucietur, et per vices quiescet, donec animi deliquium tumultum sedet.

"Infantum inferiorum extremorum convulsiones, ex ascaridibus rectum intestinum occupantibus, hanc theoriam confirmant.

"Purgantia, etiam drastica licet imprudentur abhibita, propterea forsan,

In the treatment of marasmus, a disease unequivocally and essentially connected with morbid derangement of the digestive organs, purgatives constitute our most important remediate resource. In the first stage of this disease, which, according to Hamilton, extends from its commencement to the accession of the febrile symptoms, and in which "the bowels are not altogether torpid, neither are they overloaded with accumulated fæces, *mild* purgatives will, in general, effect a cure." When, however, the disease has advanced into the second, or febrile stage, more *active* aperients must be regularly and perseveringly employed. For this purpose Dr. Hamilton recommends the exhibition of small, but frequently repeated doses of purgative medicines; "so that the latter dose may support the effects of the preceding ones. When the bowels are once opened, stronger purgatives, given at longer intervals, will accomplish the cure." In my own practice I have obtained the happiest results from the employment of mild purgatives, repeated every third or fourth day, together with a light but nourishing diet, in the treatment of this disease.

Dr. Hamilton speaks favourably of the use of purgatives in the treatment of chlorosis. "The slightest attention to the history of the disease," says he, "evinces that costiveness proceeds and accompanies the other symptoms. Costiveness induces the fæculent odour of the breath, disordered stomach, depraved appetite, and impaired digestion. These preclude a sufficient supply of nourishment, at a period of growth when it is most wanted; hence paleness, laxity, flaccidity, the nervous symptoms, wasting of the muscular flesh, languor, de-

epilepsia spurias, choream sancti viti, aliosque spasmodicos sanarunt morbos qui desperati a medicis habebantur."

bility, the retention of the menses, the suspension of other excretions, serous effusions, dropsy and death." He accordingly recommends purgative medicines, until the bowels are well emptied, after which he has recourse to tonics. I have never used purgatives in this disease, nor am I disposed to employ them to the extent recommended by Dr. Hamilton. The costiveness, as well as the amenorrhœa, is, I think, in some instances at least, the consequence and not the cause of the general debility and torpor of the system. There can be no doubt, however, that these effects may, of themselves, contribute to keep up that state of the general system which in the first place produced them. And hence, although purgatives will be proper, to remove at least one of these symptoms, namely, constipation, still, our main dependence in cases unattended by febrile irritation, ought to be placed on the employment of tonics, nourishing diet, and exercise. The same author speaks in very high terms of the employment of purgative medicines, in that variety of vomiting of blood which "attacks females who are from eighteen to thirty years of age." The attack of this variety of hæmorrhage "is preceded by great languor and oppression, both about the chest and the præcordia; and by a sense of fulness of the præcordia; by cough, dyspnœa, and sometimes by pain of the breast; by loss of appetite, headache, vertigo, and disturbed sleep; the eye is dull, the countenance is expressive of much distress, the pulse is feeble, and the bowels are constipated." "In this state of impaired health, a particular fit of sickness and nausea is the immediate forerunner of the attack of the vomiting of blood." I have in a few instances known very considerable advantage to result from free purgation in this affection, where it was connected with a

loaded state of the bowels. Dr. Hamilton speaks strongly in favour of this practice. "My success," says he, "has been so uniform, that I now lay it down as a certain position, that the proper exhibition of purgative remedies affords sure and effectual means of removing the vomiting of blood which I speak of."

Cathartics have long been considered as important remedies in the cure of dropsies. As I shall, however, have occasion to speak more particularly on this subject when I come to treat of cremor tartar and elaterium, it will be unnecessary to dwell particularly on this point in the present place.

OF THE PARTICULAR CATHARTICS.

RADIX JALAPÆ.—JALAP.

Jalap is the root of the *Ipomœa Jalapa*, a perennial plant, indigenous to Mexico, and some of the West India islands. It is brought to us either in transverse slices or in pieces of a pyriform shape; these are compact, solid, and heavy; rugous and blackish externally, and of an obscure gray colour internally, exhibiting, when divided transversely, a number of concentric circles of a darker hue and more dense structure than the intervening spaces.* When powdered, it has a peculiar and somewhat nauseous odour, and a slightly acrid and sweetish taste. It contains a large propor-

* Jalap is said to be sometimes adulterated with *briony root;* but this may be readily distinguished from jalap by its pale colour, its spongy texture, and its greater lightness and bitterness, and by its not burning so readily when held to the flame of a candle.—Burdach.

tion of resin, upon which its purgative powers seem almost entirely to depend. It contains also a gum, which, though almost wholly destitute of laxative properties, is said to possess active diuretic powers; some extractive matter, with fæcula and salts, also enter into its composition. It appears that a combination of the resinous, gummy, and extractive principles of this root, "is requisite for the production of its *full* cathartic effect;" and hence, proof spirit is its proper menstruum.* The relative proportion of resin (with regard to the other component substances) varies considerably in different specimens of the root.†

Jalap is commonly given in the form of powder. From twenty to forty grains may be given at a dose, according to circumstances. In combination with calomel it forms one of the mildest and most effective purges with which we are acquainted. This combination is particularly applicable, when we wish to emulge the biliary organs, to excite the healthy functions of the liver, and to produce prompt and copious alvine evacuations. Hence calomel and jalap in combination are very generally preferred to other purgatives in the treatment of bilious fever, jaundice, hepatitis, &c. The proportion in which these two substances may be combined varies considerably. About ten grains of the former, with fifteen of the latter, forms a very suitable mixture.

A combination of jalap and cremor tartar, in the

* Paris.

† The jalap root "is apt to be attacked by worms, which, however, are said to devour the amylaceous or softer parts only, leaving the resin; so that the worm-eaten drug is more powerfully purgative than that which is sound. Out of 397 parts of the former, M. Henry obtained 72 parts of resin, while from an equal quantity of the latter, he procured only 48 parts."—*Dispens. of the U. States, &c.*

proportion of about twenty-five grains of the former, to forty or sixty of the latter, forms a very useful cathartic in dropsical cases. It powerfully excites the intestinal exhalents, causing them to pour out large quantities of serous fluid, and, consequently, producing copious watery evacuations. It is on this account, too, that this combination forms a peculiarly efficacious cathartic for reducing certain local inflammations, such as that of the hip disease, ophthalmia, &c.; for it not only abstracts copiously from the general circulation, but also excites a strong afflux to the intestinal exhalents, and thereby diminishes the determination of the circulation to the parts affected.

Dr. Aiken asserts that fifteen grains of jalap, given in union with two or three grains of ipecacuanha, will purge more promptly and actively than twice this quantity of jalap given by itself. The officinal preparations of this substance are: the *pulvis jalapæ compositus; extract jalapæ; tinctura jalapæ; tinctura sennæ composita.* The Prussian Pharmacopœia contains a formula for preparing the *sapo jalapinus*, which is said to operate mildly and promptly.* The dose of this preparation is from three to five grains for children, and twelve to twenty grains for an adult. The resin acts powerfully, but is apt to produce violent griping pains. Its dose is from gr. x. to ℈i. It should be well rubbed up with sugar or vitriolated tartar, in order to obviate its griping effects.

The following is an excellent formula for administering this preparation:

* This is made by taking equal parts of castile soap and of resin of jalap, and digesting them in a sufficient quantity of alcohol, with a moderate degree of heat, and evaporating to the consistence of a conserve.

℞.—Resin. jalapæ gr. x—xv.
Vitel. ovi. Nr. ii.
Aq. fontanæ ℥i.
Syrup. zingiberis ℥ss.—M. ft. emuls. To be taken at once.

Richter was in the habit of prescribing it as follows:

℞.—Resin. jalapæ gr. xii.
Pulv. camphoræ
Submuriat. hydrarg. āā gr. vi.
Mucilag. g. arab. q. s.—M. ut fiant. pil. ponder. gr. ii. Four of these pills are to be taken mornings and evenings, in cases requiring free and repeated purgation.

The *tincture* is now but rarely employed, and might with propriety be altogether rejected from our officinal preparations of this article. It is uncertain in its operation, and always causes very severe griping.

The sapo jalapinus, in combination with other aperient remedies, is said to form a very excellent deobstruent in chronic affections, attended with torpor and a loaded state of the bowels. Thus—

℞.—Sapon. jalap. ℥iss.
Pulv. rhei. ℥i.
Assafœtid. ℥iss.
Tart. antimon. gr. iii.
Mucilag. g. arab. q. s.—M. Divide into two grain pills. From three to six to be taken twice daily.

Vogler recommends a mixture of eighteen grains of this preparation in an ounce and a half of sweet oil as a valuable substitute for castor oil. A table-spoonful of this mixture is to be given every two hours until purging is produced. In the Polyclinic Institute at Berlin, the following combination has been used with much success for the expulsion of tape-worm.

℞.—Terebinth. venetæ ℥i.
Sapon. jalap. ℥ss.
Extr. hyoscyam. gr. vi.
Calomel gr. viii.—M. ft. pil. pond. gr. ii. Take four pills every three hours.*

* Hufeland's Journal, Bd. 62. St. vi. s. 117.

RHEUM.—RADIX RHEI.—RHUBARB.

The precise species of *rheum*, which afford the rhubarb of commerce, is still a subject of doubt and uncertainty. It does not appear that the plant which furnishes the officinal rhubarb, has ever been seen and botanically examined, in its native place. It is generally admitted, however, that the *rheum palmatum*, and the *R. undulatum*, are the species from which this root as met with in commerce, is obtained. By the London Pharmacopœia, the *R. palmatum*, is recognized as the plant which furnishes the officinal rhubarb. The Dublin Pharmacopœia, mentions both the *R. palmatum*, and *R. undulatum* as the proper medicinal species; and the United States Pharmacopœia refers the drug to the *R. palmatum*, "and other species not particularized."

Whatever may be the final determination as to the particular species of rheum which furnish the officinal rhubarb; it is certain, that at least three varieties of this root are imported into this country,—namely, the *Chinese*, the *Russian*, and the *European*.

I. Chinese Rhubarb.—*Rheum Sinense, vel Indicum.* By far the largest proportion of rhubarb imported into the United States, consists of this variety:—It is in oblong, roundish pieces, frequently compressed, or flatted on one or both sides, of an obscure yellow, or ochry colour on the external surface, "appearing as if the cortical portion of the root had been removed by scraping, and the surface rendered smooth, and somewhat powdery, by attrition." Its texture is compact and rather firm, and breaks with an uneven, rough, and ragged surface. Its specific gravity is greater than that of the Russian rhubarb. Nearly every piece is

perforated with a hole, made for the purpose of suspending the root with a cord, to facilitate the drying. The odour of the Chinese rhubarb is peculiar and slightly aromatic, the taste bitter, perceptibly astringent and gritty, when chewed. The finely pulverized root has a pale yellow, inclining to orange colour.

The Chinese rhubarb is regarded as somewhat inferior to the Russian. It is, however, sufficiently active and certain in its powers, to supply, without disadvantage, the Russian variety of the root; and as it is much cheaper than the latter, it has of late years, in a great measure, put the Russian rhubarb out of market in this country.

II. Russian rhubarb.—*Rheum Russicum vel Tercicum.*—The Russian rhubarb is in irregular and somewhat angular pieces, "appearing as if the bark had been shaved off longitudinally by successive strokes of a knife, and a portion of the interior substance removed with each shaving." The colour of the pieces is fresher and of a brighter yellow than that of the Chinese. They are also of a less compact and firm structure, and somewhat lighter, "being cut with less facility, owing to the elasticity of their substance giving way before the knife." The perforations, too, differ from those of the Chinese. They are large in the Russian root, often penetrating only to about the centre of the piece, and evidently made for the purpose of inspection.* In the Chinese root they are small, and pass entirely through the pieces, "and were intended for the passage of a suspending cord." In taste and smell

* The rhubarb taken to Russia from Tartary, undergoes a peculiar preparation, in conformity with the stipulations of a contract with the Bucharian merchants, who furnish the supply. The best is selected, and each piece perforated, in order to ascertain whether it is sound in the centre.—*U. S. Dispensatory.* By G. B. Wood, M. D. and Franklin Bache, M. D.

there is scarcely any difference between these two varieties of rhubarb. When powdered, the Russian rhubarb is of a brighter yellow colour than the Chinese, and without the orange tinge of the latter. "The greater comparative value of the Russian rhubarb has led to frequent attempts at adulteration, and the pieces of Chinese rhubarb are said to be sometimes cut down and prepared so as to resemble the Russian. Sometimes the worm-eaten pieces are made to resemble the sound, by filling up the holes with a mixture of pulverized rhubarb and mucilage, and covering the whole surface with powder. By removing this the fraud is at once revealed."—*U. S. Dispensatory.*

III. European Rhubarb.—*Rheum Britanicum.*—The rheum pulmatum, R. undulatum, and R. compactum, are pretty extensively cultivated in England, France, Germany, and Belgium; and no inconsiderable quantity is annually brought into the market from these sources. The European rhubarb is decidedly inferior, in its purgative powers, to the rhubarb imported from Russia and China. It occurs in oblong pieces, several inches in length, and often not above an inch in thickness, sometimes flattened on one or both sides, and occasionally cylindrical, rather long, and comparatively thin. The European is of a much more ligneous texture than the Asiatic variety, and, when pulverized, exhibits a *reddish*-yellow colour. Its odour is disagreeable and nauseous; its taste quite astringent, and when chewed it does not give much colour to the saliva, nor does it feel gritty between the teeth."—*U. S. Dispensatory.*

According to the analysis of M. Henry, rhubarb contains a peculiar yellow colouring principle; a fixed oil, which, by being subjected to heat, becomes rancid, and is soluble in alcohol and ether, starch, gum, tan-

nin, lignin, oxalate of lime, a minute proportion of supermalate of lime, sulphate of lime, a salt of potassa and oxide of iron. The white or reddish streaks which run through it, consist almost entirely of sulphate and oxalate of lime. It was supposed to contain a peculiar acid, to which the name of *rheumic* acid was given, but it has been satisfactorily ascertained, that this supposed new acid, is nothing more than the oxalic acid. Rhubarb has been frequently subjected to minute chemical analysis. Paff, and afterwards Caventeau, obtained from it a peculiar principle, to which they gave the name of *rhabarbarin*.* This substance appears to be identical or very closely allied to yellow colouring matter of rhubarb obtained by M. Henry. It consists of a dark yellow, or yellowish-brown, hard, shining, opaque mass, of a bitter, harsh, and nauseous taste, and the odour of rhubarb, insoluble in cold, but readily dissolved by hot water, alcohol, and ether. This is, perhaps, the purgative principle of rhubarb. It does not appear to possess any alkaline properties. Nani obtained a *sulphate of rhubarbarin*.† The Chinese rhubarb contains less tannin, resin, and oxalate of lime, but a greater proportion of extractive and gallic acid, than that which comes from Turkey. Out of sixty parts of Turkey rhubarb, twenty-four are taken up by water at the temperature of 212°. By long boiling it loses its cathartic properties, but becomes more astringent and bitter. Alcohol extracts 2.7 parts out of ten. That which comes from China is, however, more soluble. One half of its weight is taken up by boiling water; and alcohol extracts four out of ten parts. "Its habitudes with acids, alkalies, and neutral salts differ likewise from

* Mat. Med. Bd. iii. s. 23. and Bd. vi. s. 308. Also, Bd. vii. s. 154.

† Bibl. Universelle, June, 1823.

those of the Russian variety."* The active properties of rhubarb do not, however, appear to reside wholly in the extractive principles of the root; or more correctly speaking, perhaps, they seem, in part, at least, to consist in a volatile principle. This may be inferred from the fact, that the purgative powers of the root diminish very materially by age; more especially when it is suffered to remain exposed for a long time in the pulverized state.

With its cathartic properties rhubarb possesses a considerable degree of astringency. Given in small doses, as from four to ten grains, it acts as a stomachic and gentle tonic. In the dose of from twenty to forty grains, it operates as a mild and pretty active cathartic; but, from its astringency, it is apt to leave the bowels in a costive condition after its operation. From this union of properties, it is evident that it is not well suited to the treatment of inflammatory diseases, nor, indeed, to that of any other complaint in which we wish at once to evacuate the contents of the bowels, and to abstract from the general circulation by means of the intestinal exhalents. It has been much recommended in dysentery, and there can be no doubt of its peculiar utility in the advanced stages, or chronic form of this complaint; but in the commencement of the disease, before the inflammation has been considerably moderated by more decisive antiphlogistic measures, rhubarb is not an appropriate cathartic.

On the contrary, however, the very astringency which rhubarb possesses, in common with its cathartic properties, renders it particularly useful in the treatment of diarrhœa, and other diseases connected with a laxity or debility of the intestinal canal. It is evident, that

* Paris's Pharmacologia.

much advantage is to be derived in affections of this kind, from a remedy, which, like the present one, at once evacuates the bowels of their vitiated contents, and acts upon them as a gentle tonic.

In the treatment of indigestion, rhubarb is decidedly the most useful purgative we possess. Where, from debility of the digestive organs, much acid is generated in the primæ viæ, rhubarb may be very advantageously exhibited in union with magnesia. In the diseases of infants this medicine has been long regarded as peculiarly beneficial. It is especially useful, when combined with magnesia, in the griping bowel complaints of very young infants. From one to two grains of rhubarb with three or four grains of magnesia, and two or three grains of powdered valerian root, rubbed up with a little cinnamon-water and sugar, forms a most excellent medicine in cases of this kind.

United with aromatics, rhubarb forms a highly useful aperient in atonic gout, attended with uneasy sensation and debility of the stomach. Warner's cordial* has been used with much advantage for this purpose. When taken internally, its colouring matter passes rapidly through the circulation, and is soon conspicuously manifested in the urine. Its purgative effects are considerably enhanced by uniting it with neutral salts; "the super-sulphate of potass forms a very useful adjunct, and its acidulous taste completely covers that of the rhubarb."

Externally, powdered rhubarb is sometimes employed as an application to ulcers, for the purpose of promoting granulations. It is particularly recommended by

* Rhubarb bruised ℥i. senna ℥ss. saffron ʒi. powdered liquorice ʒiv. raisins pounded ℔i. brandy ℔iii. Digest for a week and strain.

Home* as an application to old and indolent ulcers; and some have advised it as a useful stimulant to chronic venereal sores. If it produces considerable pain, in ulcers of this kind, a few grains of powdered opium should be mixed with it. I have derived much benefit from sprinkling indolent chancres with a powder composed of about a drachm of very finely powdered rhubarb with twenty grains of calomel and ten grains of powdered opium.†

The officinal preparations of rhubarb, are—1. *Tinctura rhœi aquosa.* This preparation is not introduced into the English and American Pharmacopœias, although well deserving a place among the preparations of this article. According to the Prussian Pharmacopœia, it is made by pouring twelve ounces of boiling water on one ounce and a half of the rhubarb with three drachms of carbonate of potash, and digesting twelve hours. To ten ounces of the strained infusion, two ounces of cinnamon-water are to be added. Simply as a purgative, this preparation does not possess much value, but in the colic and griping of infants from acidity in the primæ viæ, it is a most excellent remedy. From ten to twenty drops may be given to an infant. 2. *Tinct. rhœi.* 3. *Tinct. rhœi et aloes.* This is an excellent preparation in chronic hysteria attended with weakness of the digestive powers, flatulency, and torpor of the bowels. It may also be used with much advantage in amenorrhœa, attended with a sluggish state of the system, and intestinal torpor. The formula is intro-

* Observations on the Practical Treatment of Ulcers, &c.

† *Incompatible substances.* "The stronger acids; the sulphates of iron and zinc; nitrate of silver; tartarized antimony; acetate of lead; oxymuriate of mercury; and the infusions of cusparia, cinchona, catechu, galls, and of some other astringent vegetables; the alkalies deepen the colour, but produce no decomposition."

duced into the American Pharmacopœia. A table-spoonful should be taken two or three times daily. 4. *Tinct. rhœi et gentianæ*, (Am. Pharm.) is valuable in indigestion, from mere gastric debility. 5. *Syrupus Rhœi.* 6. *Pilulæ rhœi composit.* (Ph. Edin.) It may be advantageously used in cases of amenorrhœa, attended with general relaxation and torpor of the bowels.

Formulæ.

℞.—Rad. Rhœi ʒii.

Rasur. liq. quass. ʒss.—Digest for twelve hours with ℥v. of boiling water. Strain and add, tinct. aromat. ʒi. syrup. cort. aurant. ℥ss.—M. A table-spoonful of this infusion may be taken every three hours, in cases attended with much debility and relaxation, where it may be thought necessary to keep up a moderate action of the bowels, and to increase the tone of the stomach.

℞.—Rad. rhœi. ʒiss.

Rad. ipecac. ʒss.—Boil them in three ounces of water about fifteen minutes, then strain and add, pulv. gum arab. ʒiii.—M. A table-spoonful of this decoction taken every two or three hours will often prove highly serviceable in mild cases of dysentery (Jahn Richter.)

℞.—Tartrate of potash.

P. cort. aurant.

P. rad. rhœi

P. sem. fœnicul ãã ʒii.

Ol. cajeput gtt. viii.—M. A tea-spoonful of this mixture is an excellent remedy in habitual torpor of the bowels. This is the *solamen hypochondriacum* of Klein.

FOLIA SENNÆ.—SENNA LEAVES.

According to the most recent authentic observations, this drug is furnished by at least three different species of the genus Cassia, namely, *C. acutifolia*, *C. obovata*, and *C. elongata*. The leaflets of the *C. acutifolia* are from half an inch to an inch in length, lancet-shaped, very acute, distinctly nerved, oblique at the base, and of a yellowish-green colour. The pods are about an inch long, and half an inch broad, flat, elliptical, mem-

branous, grayish-brown, very little or not at all curved, containing six or seven firm, heart-shaped, grayish seeds, in a corresponding number of distinct cells. The leaflets of the *Cassia obovata* are obovate, very obtuse, and in other respects similar to those of the C. acutifolia. The pods are curved, or kidney-shaped, very much compressed, of a greenish-brown colour, containing from eight to ten seeds. This species is indigenous to Syria, Egypt, and Senegal. The leaflets of the *Cassia elongata* are long, varying from an inch to twenty lines in length, very acute, thin, oblique at the base, with very short and rather thick foot-stalks. The pods are thin, smooth, shining, slightly curved, very obtuse at the summit, with small mucronate points, and of a greenish-olive colour along the margin, and dark in the centre.

In commerce, several varieties of senna occur, the most important of which are the *Alexandria senna*, the *Tripoli senna*, and the *India senna*.

I. The first of these varieties (*Alexandrian*), is imported, as its name implies, from Alexandria, in Egypt, and consists principally of the cassia acutifolia, mixed, sparingly, with the leaflets of the cassia obovata, and frequently also with the leaves of the *Cynanchum oleæfolium*, or, "according to M. Royer's inquiries, the proportions in which these three constituents of Alexandria senna are mixed together, are five parts of the C. acutifolia, three of the C. obovata, and two of cynanchum. Hence, in examining a parcel of what is known in commerce as Alexandria senna, we find, 1. A large proportion of very acute, lance-shaped leaflets, always less than an inch in length, (*C. acutifolia.*) 2. A less proportion of obovate leaflets, having a rounded and very obtuse summit, gradually diminishing in breadth towards the

foot-stalk, (*C. obovata.*) 3. A small proportion of long, firm, and rather thick leaflets, without any lateral nerves on their under surface, of a light colour, and a regular or equal base." These are the leaves of the *Cynanchum oleæfolium*, and as they are exceedingly harsh and irritating in their action on the bowels, they should be regarded as an adulteration. They may always be readily distinguished from the cassia leaflets, by the absence of lateral nerves, and the regularity of their base; in both of which circumstances they differ, very obviously, from the genuine senna leaflets, "which, from whatever species derived, are always marked by *obliquity* of base, one side being inserted in the petiole, at a point somewhat lower than the other, and at a different angle." (*Dispensat. of the U. States.*)

II. The *Tripoli senna.* This is generally regarded as the least valuable variety of senna brought to this country. This opinion does not appear to be well founded; for the *genuine* Tripoli senna "consists exclusively of the *Cassia acutifolia*, containing neither the obovate senna nor the leaves of the cynanchum, and is generally free even from the pods of the first mentioned species. The leaflets, however, are much broken up, and it is probably on this account that this variety is less esteemed than the Alexandrian."

III. The *India senna*; known also by the name of *Mocha* senna, contains a much larger proportion of pods and leaf-stalks than the two preceding varieties. It does not appear to be a mixture of different species, for all the leaflets it contains are alike in shape and appearance. They are longer and narrower than those of the varieties already mentioned, being derived from the *Cassia elongata.*

The active principles of senna are completely ex-

tracted both by water and alcohol. "The leaves yield about one third of their weight to boiling water, one pint of which is requisite to exhaust the strength of an ounce of the leaves." According to an interesting analysis of senna, made by M. Bouillon Lagrange, it appears, 1. That the watery extract of senna is almost entirely soluble in alcohol, and that the part thus soluble is not a resin, as has been supposed, but a substance which requires simply the addition of a certain portion of oxygen, to convert it into a matter which has all the characteristics of resin. 2. That part soluble in water contains sulphate of potass, potass, carbonate of lime, magnesia, silex, &c., together with that substance which I have just said is connected with a matter possessing the character of resin by uniting with a portion of oxygen, and to which senna seems to owe its purgative qualities. It appears, also, that this peculiar substance has a very strong affinity for oxygen; and hence we see the propriety of the caution given by Dr. Paris, that the infusion of senna should never be suffered to stand long before it is taken; "since, by simple exposure to the air, for only a few hours, in consequence of the powerful affinity of its extractive matter for oxygen, a yellow precipitate takes place, and the infusion loses its purgative quality." "In preparing it, therefore," he adds, "we see the necessity of conducting the process in *covered* vessels, and of making only such a portion as may be required for immediate use." The senna has been more recently subjected to a minute chemical examination by Lassaigne and Fenuelle.* From this analysis it appears that the senna leaves contain, 1. A peculiar principle, to which the name of *cathartine* has been given. 2. *Chlorophylle*, or the prin-

* Richter's Specielle Arzneimittellehre, Bd. 3. 2. p. 326.

ciple that gives to vegetables their green colour. 3. A fixed oil. 4. A small portion of an ethereal or volatile oil. 5. Albumen. 6. A yellow colouring matter. 7. Mucilage. 8. Salts of the vegetable acids; that is, the malate and tartrate of lime, and acetate of potassa. 9. Mineral salts. The most important of these constituents is the *cathartin*. This substance does not crystallize. It is of a reddish-yellow colour, and has a peculiar smell, and a bitter and nauseous taste. It is soluble in alcohol and water, in all proportions, but insoluble in ether. It attracts the humidity of the atmosphere, and becomes moist when exposed to the open air. It is powerfully cathartic, and doubtless constitutes the active purgative principle of the senna.

Senna is hardly ever employed as a cathartic, except in the form of an infusion. In order to divest it of its griping quality, which it possesses to a very considerable degree, it is commonly mixed with other substances, such as manna, coriander, fennel, or anise seeds. For this purpose, however, the best adjuncts are soluble tartar and alkaline salts, which have the power "of increasing the solubility of its oxidized extractive." A decoction of guaiacum and vegetable bitters are said to increase it powers and to render its operation milder.*†

It appears to be particularly well adapted as a purgative in cases attended with torpor of the bowels,

* Paris's Pharmacologia.

† The *infusum sennæ limoniatum*, is a very convenient mode of exhibiting this medicine to children. It is made by pouring six ounces of boiling water upon ℥ss. of fol. senna, ʒii. lemon peel, and ʒii. lemon juice.

The *infusum laxativum viennense*, is also an excellent preparation. It is made thus: folior. sennæ ʒii. cremor tart. ʒiss. pulv. rhei. ʒi. sem. coriander ʒiss. mannæ ℥i. aquæ ferventis ℥vi. Digere per 4t. horas.

Selway's prepared essence of senna.—"This is a concentrated infusion of senna in combination with an alkali. It is admirably adapted for domestic use."—PARIS.

unconnected with irritation or phlogosis of the mucous membrane of the alimentary canal; and where we desire to make a strong impression on the intestinal nerves, as in cases of hemiplegia, apoplexia, &c. In individuals of an irritable habit, where there is a predisposition to bowel complaints; and in general in all affections attended with an excited state of the intestinal canal, this purgative must be avoided. It may be beneficially used in those cases of general depression which arise from irritating matters in the bowels, and which soon after parturition sometimes give rise to symptoms resembling puerperal fever.

It is observed by Alibert, on the authority of M. Bouillon Lagrange, that the powdered senna is apt to undergo alteration or decomposition when suffered to remain exposed to a humid atmosphere. In such a situation, it becomes covered with a kind of pellicle, or mouldiness, which contains a small portion of potass. The powder, however, is but very seldom employed, except in the form of an electuary in combination with other purgatives.

Various substances form precipitates with the infusion of senna. The infusion of galls, of the yellow cinchona, and the solution of subacetate of lead, precipitate the *cathartin*. The infusion is also disturbed by tartarized antimony, and the acetate of lead, but they do not precipitate the cathartin. Strong acids, lime-water, the nitrate of silver, corrosive sublimate, and some other substances, cause more or less disturbance, in the senna infusion, but it does not appear that they alter or weaken its purgative properties.

The officinal preparations are: 1. *Electuarum lenitivum*, (*confectio sennæ*) an excellent composition in cases

of habitual costiveness. 2. *Tinctura sennæ.* 3. *Tinctura sennæ compositum*, of the London Pharm.

Formula.

℞.—Electuar. lenitiv.	ʒvi—x.
Acid. tartar.	℈ii—℈iii.
Sacchar. alb.	ʒii.
Aq. flor. aurant.	ʒii.
Æther acet.	℈ss. M.

Of this a table-spoonful may be taken every hour or two. It is a mild and most excellent laxative, and may be given with peculiar advantage in weak and irritable habit. I have employed it much in practice, and esteem it particularly valuable in weak and nervous persons affected with torpor of the bowels and hæmorrhois. It is strongly recommended in cases of this kind by Heim.*

GAMBOGIA.—GAMBOGE.

This gummy-resinous substance is, by the majority of writers, mentioned as the product of the *Stalagmitis cambogioides*, a tree of middling size, growing abundantly in the kingdom of Siam, and in Ceylon. Dr. Duncan, however, asserts, that a specimen of the inspissated juice of the stalagmitis, which was sent to him from India, did not agree, in its properties, with the genuine officinal drug. The opinion of Persvan, De Candolle, and Richard, that the gamboge of commerce is derived from the *Garcinia cambogia* (Cambogia Gutta of Lin.), is satisfactorily contradicted by the testimony of Dr. White, who it appears, was well acquainted with the garcinia cambogia. "On the whole, it must be admitted, that we are uncertain, not only as to the precise tree which affords the officinal gamboge, but also whether it is derived from any one tree exclusively, or from several."

Gamboge consists of small, irregular, solid lumps, of saffron yellow colour, breaking with a shining or vitre-

* Rust's Magazine, Bd. 3. p. 308.

ous fracture. When moistened, it assumes a beautiful bright yellow colour. It is destitute of odour, but has a slightly acrid taste. It consists of one portion of gum, four of a very brittle resinous matter, and a portion of a peculiar saponaceous principle. Neither water nor alcohol dissolve it entirely, unless potash be added to the water, or ammonia to the alcohol. In a solution of caustic potash it is readily and wholly dissolved; the solution has a beautiful red colour, and may be mixed with water and alcohol without becoming turbid.*

Gamboge acts very powerfully both as a cathartic and an emetic, and is, in consequence, condemned by some, as apt to excite violent and dangerous hypercatharsis and vomiting. Others, on the contrary, speak strongly in its favour, and represent it as a mild, certain, and safe cathartic. Dr. Ferriar, especially, recommends it as one of the gentlest and most certain of our purgative remedies. "After a long and extensive experience," says he, "of the qualities of gamboge, I can recommend it as one of the gentlest, most certain, and least nauseous laxatives in the materia medica. Being nearly free from either smell or taste, it is particularly well adapted to the management of children, with whom its anthelmintic power is likewise valuable."† It seems, however, to be generally allowed, that its action is too powerful for the ordinary purposes of purgative remedies; and, unless as an adjunct to other substances of this class, it is, at present, but seldom employed in practice.

Gamboge has been a good deal employed in dropsy. By proper management, it is undoubtedly a medicine of considerable value in this disease. It is particularly a

* Pfaff, Mat. Med.

† Medical Histories, p. 270. Philad. edit. 1816.

useful hydrogogue in ascites, attended with a sluggish state of the system. In cases accompanied with a general irritable and phlogistic habit, it rarely operates favourably; and it is particularly to be avoided where there is any evidence of the existence of high irritation of the mucous membrane of the alimentary canal. In ascites, it is commonly given in union with cream of tartar, in the proportion of about two grains of the former to half an ounce of the latter, for a dose. Large watery stools, and an increase of urine, are generally produced by the operation of such a dose. Dr. Ferriar relates several remarkable instances of the efficacy of gamboge in dropsy, given in union with the nitrous or vitriolic ether. He directs five grains of gamboge, with two drachms of spiritus ætheris vitriolici, in a draught, two or three times a week. This composition acts as a gentle purgative, and considerably increases the urine. "When there is imminent danger of suffocation," says Dr. Ferriar, "from the quantity of water effused in hydrothorax, I have frequently given immediate relief by the following purgative draught.* A draught of this kind may be given twice or thrice a week, in such cases, while the cream of tartar and diuretic drops† are employed on the intermediate days." An excellent mode of giving this article in dropsical and

* ℞.—Cambog. gr. iv.
Sp. æther. nitros. ʒi.
Tinct. senn. ʒii.
Syrup. rhamni.
Aq. menth. āā ʒss.—Misce.

† ℞—Oxymel. colchici.
scill.
Tinct. nicotian.
Sp. æther. nitros. āā p. æ.—M.
Capiat cochleare parvulum, ex aquæ pauxillo, quater in die.

other affections, is, a solution of it in the *liquor potass. carbonici*, in the proportion of a scruple of the gamboge to half an ounce of the latter. Of this solution from thirty to forty drops may be given three or four times daily.

Gamboge has also been frequently employed with advantage for the expulsion of intestinal worms. It has been especially recommended against the tape-worm, and as an active cathartic, either after the exhibition of more direct anthelmintics, or independent of such remedies; there can be no doubt of its occasional beneficial operation in such cases.

Given in minute doses, so as not to produce either vomiting or purging, this remedy is said to be serviceable, as a stimulant, in chronic rheumatism, asthma, and particularly in exciting the activity of the portal circulation.*

Its great solubility increases its tendency to act upon the stomach and to excite vomiting. This effect is accordingly much diminished by giving it in combination with other substances, which lessen its solubility, and hence the addition of a portion of aloes to it (as in the *pil. cambogiæ compos.*) renders it a very mild and unirritating purgative.

To obviate its tendency to produce vomiting, Dr. Cullen prescribed it in small doses, and repeated it at short intervals until purging was produced. Dr. Ferriar, in his Medical Histories, says: "a very commodious form for exhibiting gamboge, is a solution in distilled water, in the proportion of half a grain to half an ounce of water. A table-spoonful may be given to an adult every hour till it operates. A tea-spoonful of this solution, given in the same way, is a dose for a

* Burdach's *Arzneimittellehre*, Bd. iii. s. 66.

child under twelve years of age. When given in this manner, doses of seven or eight grains have been found necessary to move the bowels, and it has proved strongly diuretic."

Formulæ.

℞.—G. cambogiæ ℈i.
G. arab. ʒi.
Solve in aq. fontanæ ʒiv.
Adde potassæ carbonat. ʒss.
Syrup. limonis ʒss.—M. Take a table-spoonful every two or three hours.

℞.—G. cambogiæ
Sulph. aurant. antimonii.
Ext. scillæ.
Ext. hyoscyam. āā ℈i.—M. Divide into two grain pills. Take one pill every three hours, as a hydrogogue in dropsical affections.

The *sapo G. guttæ* of the Germans, is said to be a very excellent hydrogogue preparation. It is made by boiling six ounces of gamboge with three drachms of caustic potash in nine ounces of water, until they begin to unite; and then adding two and a half drachms more of caustic potash dissolved in four ounces of water, and simmering the whole until it has acquired the consistence of a soap. From twelve to twenty grains of this mass is said to operate copiously, without exciting the severe tormina, otherwise so apt to be produced by gamboge.

ALOES EXTRACTUM.—ALOES.

Three varieties of aloes are imported into this country, namely, the *Cape*, the *Socotorine*, and the *Hepatic*.

I. *Cape Aloes.* By far the greatest proportion of aloes met with in the markets of this country is of this variety. It has, not unfrequently, been confounded with the socotorine; but it differs, very obviously, from this variety, both in appearance and sensible properties.

Externally it is of a yellowish colour; but when broken, it presents a smooth and glassy surface, of a *very dark-olive* colour, approaching to black; the edges of the fragments being translucent when held up to the light. The powder is "of a fine greenish-yellow colour. It has a strong and disagreeable odour, without the slightest mixture of aromatic." This variety of aloes "is very brittle, and readily reduced to powder; but in very hot weather it is apt to become somewhat soft and tenacious."

II. *Socotorine aloes.* This variety of aloes has a *reddish-brown* colour, with a slight admixture of yellow. It breaks with a smooth concoidal fracture, with sharp and translucent edges. When powdered it is of a bright yellow. Its bitterness is accompanied with a very perceptible aromatic flavour. It softens by the heat of the hand, and in warm weather is always somewhat tenacious. The socotorine is generally regarded as the most valuable variety of aloes; but it is very doubtful whether, in any respect, it is superior to the Cape aloes.

III. *Hepatic aloes.* This variety is produced in the West Indies and Spain. It is of a reddish-brown colour, but darker and less glossy than the socotorine. Its odour is very unpleasant, without the slightest aroma; and its intense bitterness is accompanied with a peculiar nauseous taste. It breaks with a somewhat uneven and splintery fracture, and the edges of the fragments are but very imperfectly translucent. At a temperature of about 96° it softens and becomes adhesive. When pulverized, it is of an obscure olive-yellow colour. It is but seldom brought to this country, and is universally and justly regarded as decidedly inferior to the two preceding varieties.

According to the analysis of Tromsdorff, socotorine aloes consists of twenty-five parts of resin, and seventy-five of a saponaceous extractive matter, soluble both in alcohol and in water; a slight trace of gallic acid may also be detected in it. This saponaceous extract is intensely bitter, and possesses a faint odour, resembling in some degree that of saffron. The resinous matter is not very bitter, and possesses but feeble powers as a purgative. Mr. Braconnot "conceives aloes to be a substance *sui generis*," which he terms "*bitter resin*." Berzelius considers the resinous matter obtained by Tromsdorff, as nothing more than extractive, changed by the action of air. He calls this resinous substance *apotheme*.

Aloes is but very slowly dissolved by cold water. Boiling water dissolves it readily; but, on cooling, the resinous portion, or apotheme of Berzelius, is precipitated. Long boiling deprives it entirely of its purgative properties, by converting the extractive into the insoluble apotheme. Its appropriate solvent is proof spirit. The solubility of aloes is increased "by alkaline salts and soaps; but, by such a combination, aloes undergoes a material change in its medicinal properties; the bitterness is diminished, its purgative effects impaired, and it ceases to operate specifically upon the large intestines, a fact so far valuable as it enables us in certain cases to obviate its irritating action upon the rectum."*

Aloes is a slow, stimulating cathartic, exciting a sensation of warmth in the stomach and bowels, and directing its operation more especially upon the lower portion of the intestinal canal. This is supposed to depend on the slowness with which it is dissolved; in

* Paris's Pharmacologia.

consequence of which it passes through the stomach and small intestines before it has had time to dissolve and act upon them. Being, however, at last dissolved in its progress through the large intestines, it acts upon this portion of the bowels with considerable force, and causes copious fæculent evacuations. However plausible this explanation of the circumstance in question may be, its correctness is rendered extremely doubtful, by the fact, that even when administered in a fluid or dissolved state, aloes acts chiefly upon the lower portion of the intestinal canal. This circumstance would, therefore, appear to depend rather on the peculiar nature of its purgative properties than on the degree of its solubility. Dr. Cullen observes, that aloes evacuates the bowels simply by exciting the peristaltic action of the intestines, without increasing materially the intestinal secretions, as is evident from the state of the evacuations, which are hardly ever liquid.

In consequence of its tendency to act more particularly on the rectum, and thereby create an increased flow of blood to the pelvic viscera, aloes is a good deal employed to promote the secretion of the menses; for which, indeed, it seems to be well adapted in cold, phlegmatic, and costive habits. This very tendency, however, renders aloes an improper aperient in persons subject to hæmorrhoidal tumours, or affected with any other disease of the rectum.

From its acting in small doses as a slow aperient, it is well suited to obviate habitual costiveness. When employed with this intention, it is necessary to avoid a strong operation, as it is apt, when it acts fully, to leave the bowels in a dry and costive condition. Given in small doses, as from one to two grains, it acts as a tonic upon the alimentary canal; promotes digestion;

and, in relaxed and torpid habits, keeps up the regular peristaltic action of the intestines; and it is only when it produces this slow but natural action of the bowels, that it can be employed with propriety in constitutional costiveness. It should be recollected, however, that the habitual use of this aperient, has a tendency to produce congestion in the veins of the pelvic viscera, and thereby to cause hæmorrhoidal tumours and discharges. The aperient operation of aloes is not proportionate to the size of the dose. Four or five grains will often produce nearly the same opening effect as ten or fifteen grains. It is, however, almost always very slow in its aperient effects. It seldom operates before the expiration of five or six hours after it is taken, and often not until after the lapse of ten or twelve hours. In an uncombined state, indeed, it hardly ever produces large evacuations, whether it be given in a small or large dose. In union with other articles, however, it furnishes us with several very useful preparations, viz: pulv. aloes compos. L.; pil. aloes cum myrrha. L. E. D.; pil. aloes compos.; pil. aloes cum assafœtid. E.; pil. aloes cum colocynth. E.; pil. scammon. cum aloe. D.; extract. colocynth. compos. L. D.; tinct. aloes comp. L. E. D.; tinct. aloes ætherea E.; extract. aloes aquosam.

Individuals of a sluggish and irritable habit, with a slow and languid state of the circulation, generally bear this aperient much better than persons of sanguine and irritable temperaments. In subjects of this latter habit, its operation is apt to leave a dry and irritated state of the colon and rectum, with protracted constipation.

Externally, aloes has been used in weakness of the eyes, as well as in opacities of the cornea. Janin

speaks in the highest terms of the following collyrium: R. vin. alb. lb. i.; aloes; tutiæ præp. croci metallor; āā ʒi. Put them into a bottle, and digest in the sun for two months. Reil says that this tincture, diluted with an equal part of rose water, forms an excellent wash for weakness of the eyes attended with a profuse flow of tears. Beer recommends a salve composed of ten grains of sulphate of zinc, the same quantity of the acetate of copper and burnt alum, with eight grains of aloes and half an ounce of honey, as a very useful application for the removal of opacities of the cornea. It is to be applied with a small and very soft pencil to the opaque part of the cornea.

Formulæ.

Dinner Pills.—Lady Webster's, or Lady Crespigny's pills.—These popular pills are the "*pilulæ stomachichæ*, vulgo *pilulæ ante cibum*," of the Codex Medicamentarius Parisiensis, edito quinto, A. D. 1758: viz. R. aloes optimæ ʒiv.; mastiches et rosarum rubrarum, āā ʒii.; syrupi de absinthio q. s. ut fiat massa: the mass is to be divided into pills of three grains each. The operation of this pill is to produce a copious and bulky evacuation, and in this respect experience has fully established its value. —*Paris's Pharmacologia.*

℞. Extract. glycyrrh. ℥ss.; carbonat. potassæ ʒii.; aloes; myrrhæ; crocci, āā ʒi; Boil them in a pint of water down to twelve ounces; then strain and add tinct. cardamoni. compos. ℥iv. Brand says, that from four to six drachms of this decoction, mixed with an equal part of some aromatic water, and taken every other morning, is a most excellent tonic aperient in debility of the digestive organs attended with acidity.

SCAMMONIA.—SCAMMONY.

This substance is the inspissated juice of the root of the *Convolvulus scammonia*, a perennial plant, growing abundantly in the mountainous parts of western Asia. It comes to us from Smyrna and Aleppo in blackish gray cakes. That which is imported from the latter place is purer and better than the Smyrna scammony.

It comes to us in large irregular masses, of a dark ash, or olive colour internally, and when recently broken, of a lighter ash, inclining to yellow, internally. Its structure is generally somewhat porous or cavernous, and occasionally nearly compact. It is readily pulverized, yielding a light ash-coloured powder. When triturated with water, it forms a slightly greenish milky fluid. It has a bitter subacrid taste, and a peculiar disagreeable odour, said to resemble old cheese. Aleppo scammony, according to the analysis of Buillon Lagrange, contains sixty parts of resin, two of extractive, three of gum, and thirty-five of insoluble matter. That which comes from Smyrna contains less resin, but more gum and extractive. It is in thin flat cakes of a darker colour, and more compact structure, than the preceding variety. Its fracture is dull and granular; its taste bitter and acrid, and when rubbed with water, it forms an opaque dirty white fluid. Proof-spirit is its best menstruum; it dissolves all except its impurities. Water dissolves about one-fourth, and alcohol two-thirds.

Scammony was one of the purgatives employed by the ancients. A decoction of the root of the plant which yields it was used by Hippocrates; and it is said to be an excellent purgative when given in this way, procuring free evacuations, without occasioning griping or any manner of sickness.* During the middle ages it was much employed as a cathartic, under the name of *diagrydium*.

Scammony is a powerful purgative. The accounts given of its effects by different writers are, however, very discrepant. Some represent it as mild and per-

* Dr. Alexander Russel, in a letter to Dr. Fothergill. See Medical Observations and Inquiries, vol. i. p. 13.

fectly safe; whilst others mention it as a violent and dangerous cathartic.

Orfila found ulcers in the stomachs of animals that had been killed by scammony. These differences in the action of this remedy, are, however, supposed "to be entirely owing to the different circumstances of the patient, and not to any hurtful quality or irregularity of operation of the medicine; where the intestines are lined with an excessive load of mucus, the scammony passes through without acting upon them; but where the natural mucus is deficient, a small dose of this or any other resinous cathartic, irritates and inflames."*

Scammony enters into the composition of many of the purgative remedies that have been recommended against worms. It enters also into several useful officinal preparations; such as the *confect. scammon.* L. D.; pulv. scammon. comp. L. E.; extract. colocynth. comp. L.; pulv. sennæ comp. L.

A very good mode of exhibiting scammony, is to triturate it with sulphate of potass, sugar, or almonds. Given in this way, it operates mildly, and with considerable promptness. It may also be very conveniently exhibited by being dissolved in a strong infusion of liquorice, and poured off from the fæces. The dose is from three to fifteen grains.† Much was formerly said of a preparation into which scammony enters as a chief ingredient, and known by the name of *Count Warwick's Powder*, or pulv. detritius. It consists of a mixture of

* Dr. Andrew Duncan's Dispensatory.

† Dr. Paris says, "that there is a compound bearing the name of scammony to be met with in the market which is altogether factitious, consisting of jalap, senna, manna, gamboge, and ivory-black. Good scammony ought to be friable, and when wetted with the finger, it should lactify or become milky; and the powder should manifest its characteristic odour, which has been compared to that of old ewe-milk cheese.—*Pharmacologia.*

sulphuretted scammony, diaphoretic antimony, and cream of tartar. Ramazzini, Baglivi, Van Swieten, and Werlhoff, recommend it as a peculiarly efficacious purgative in intermittent fevers.

Formulæ.

℞.—Aloes. spicat. ℈i.
G. scammon. gr. xii.
Extract. rhei ℈ii.
Pulv. capsici. gr. vi.—M. To be made into sixteen pills. Two may be taken on going to bed.

℞.—G. scammon. gr. v.
Pulv. rhei gr. xv.
Sub. carbonat. ammon. gr. v.—M. To be taken at once.

℞.—Lactis. amydalar. dulc. ℥iv.
Resin. jalapæ gr. viii.
Sacch. alb. ℥vi.
G. scammon. gr. vi.—M. Solve resinam jalapæ in ovi vitello, misce scammon. et sacchar. dein adde lac. amydal. (Alibert.)

COLOCYNTHIDIS PULPA.

This is the medullary or pulpy part of the fruit of the *Cucumis colocynthis*, an annual cucurbitaceous plant, growing in abundance in Syria, Arabia, and also in some parts of Spain.* The seeds appear to be wholly destitute of active properties, and are employed as an article of food in northern Africa. According to the analysis of MM. Edwards and Vavaseur, the pulp of colocynth contains a peculiar bitter principle, to which the name *colocynthin* has been given; also a resinous substance insoluble in æther, a fixed oil, extractive matter, gum, and various salts. "The infusion of colocynth, made with boiling water, has a golden-yellow colour, and becomes gelatinous on cooling."

This is one of the most ancient purgatives employed

* Dr. Paris observes, that "when the fruit is larger than a St. Michael's orange, and has black, acute pointed seeds, it is not good."

in practice at the present day. The Greek and Arabian physicians mention it in their writings as a powerful and valuable cathartic.

It is now but seldom administered in an uncombined form, on account of the great violence of its operation. It is apt to occasion severe griping; and when given in very large doses, seldom fails to produce vomiting, tenesmus, and other manifestations of high gastro-intestinal irritation. It appears to possess a particular tendency to act upon and irritate the mucous membrane of the lower portion of the intestinal canal. Orfila says, that he uniformly found the rectum in a state of high inflammation, and gangrenous, in the animals which he destroyed with this article. As a hydragogue, however, it is still occasionally given in dropsical cases; in one instance of which, I have myself prescribed it with great advantage. Along with its very active purgative powers, colocynth possesses also a considerable tendency to excite the action of the kidneys. Bang recommends a decoction of it as a good remedy in dropsy; and Hufeland considers it as the most effectual diuretic we possess, in persons of a cold and sluggish habit of body. His mode of prescribing it for this purpose is, to boil two drachms of the colocynth in a quart of beer, down to a pint, of which one or two table-spoonfuls are to be taken every day.*

This substance has also been recommended in small doses, in paralysis of the lower extremities, and in herpetic eruptions. It has been particularly praised as a remedy in paralysis of the bladder. Heim, a German writer, speaks very favourably of the *tincture of colocynth*, in union with tinctura antimonii saponata, in the

* Journal, B. v. p. 65.

proportion of twenty drops of the former to sixty of the latter every three hours, in cutaneous affections.* Christien asserts, (*Iatroleptik.*) that he has found frictions with the tincture and infusion of this article of especial service in melancholia, and other forms of torpid mania. The tincture has also been used with much benefit in the chronic nervous affections, particularly in such as are connected with a torpid state of the catamenial function. (Dalberg.)

Colocynth has been a good deal employed in coma and apoplexy; and, as the beneficial effects of cathartics in these diseases depend, perhaps, entirely on the afflux of blood which they occasion from the head to the intestinal canal, there can be no doubt that a remedy which produces such prompt and strong impressions on the bowels, and which, therefore, procures such copious watery evacuations as the present one, is well calculated to prove beneficial in affections of this kind.

The officinal preparations are: *extractum colocynthidis.* L.; *extract. colocynth. compos.* L. and D.; *pillulæ aloes cum colocynth.* D.; *tinct. colocynth.* Pharm. Borus. Bavar.

The compound extract of colocynth is a very useful preparation. In combination with calomel this extract forms one of the most effectual, and, at the same time, mildest purgatives with which I am acquainted. In cases where we wish at once to evacuate the bowels gently, but copiously, and to correct the functions of the biliary organs, I have found the pill recommended by Dr. James Johnson a most valuable medicine.

The dose of the compound extract of colocynth is from ten to fifteen grains. The colocynth, in substance, is given in doses of from five to ten grains.

* Kölpin über die Würkung der Tinctura Colocynthidis. See Hufeland's Jour. of Pract. Medicine, vol. ii. No. iii. p. 4.

The subacetate and acetate of lead, the nitrate of silver, sulphate of iron, and the fixed alkalies, disturb its infusion.

Formulæ.

* ℞.—Extract. colocynth. comp. ʒi.
Submuriat. hydrarg. gr. xv.
Antim. tart. gr. i.
Olei carui gr. v.—M. In pilulas 24 divid. Take one, two, or three.

℞.—Tinct. colocynth. ℥ss.
Ol. ricini ℥iss.—M. Heim asserts that he has derived great benefit from this mixture, applied by frictions to the abdomen, in children affected with scrofulous swellings.

The tincture, according to the Prussian Pharmacopia, is made by digesting one ounce of the colocynth with a drachm of *anniseed*, in a pound of rectified alcohol.

ELATERIUM.

This substance is obtained from the fruit of the *Momordica elaterium*, a cucurbitaceous plant, growing wild in the southern parts of Europe. The fruit of this plant bears a very strong resemblance to the common garden cucumber; differing from it merely in point of size. "When full grown it is from an inch to an inch and a half in length, and of proportionate thickness. The seeds, which when fully ripe are of a *black* colour, are lodged in a light green pulp, the interstices of which contain from half a drachm to a drachm of nearly limpid fluid." This juice, when first collected, is perfectly limpid. On standing a few hours, it first becomes turbid, and then gradually lets fall a sediment, which, when slowly dried, without being exposed to a strong light, has a yellowish white colour, with a faint shade of green. This is the pure *elaterium;* a substance which is decidedly the most powerful cathartic we possess.

Its taste is acrid and slightly bitter. It appears to be entirely insoluble in water, whether hot or cold. That which is obtained from the spontaneous deposition of the juice, is almost wholly soluble in alcohol; whilst, of that which is commonly met with in the shops, not more than one-half, and sometimes not above a fourth part is dissolved by alcohol. That part of it which is left undissolved, appears to possess no medicinal powers whatever. By treating the alcoholic extract of elaterium with boiling distilled water, Dr. Paris obtained a substance which "had the property of purging in very minute doses, while the remaining portion of eleterium was inactive." To this substance he gave the name of *elatin*, supposing it to be the active principle of elaterium. More recently, Mr. Hennel, of London, obtained a crystallizable substance, which is believed to be the true purgative principle of the elaterium,—the elatin of Dr. Paris being a combination of this substance and chlorophylle, or the green colouring matter of vegetables. The name of *elaterin* has been given to this purgative principle of elaterium. According to Mr. Hennel's analysis, one hundred parts of elaterium, consists of forty-four parts of *elaterin*, seventeen of a green resinous substance, (or as has been supposed, *chlorophylle*), six of starch, twenty-seven of woody substance, and six of saline matters.*

According to the experiments of Dr. Clutterbuck, elaterium is almost entirely, if not wholly, confined to the limpid fluid contained in the centre of the cucumber; for no other part of the plant has been found to possess active properties. It is evident, therefore, that the common mode of preparing this substance, namely,

* Hennel's analysis is published in the Journal of the Royal Institution of Great Britain, for May, 1831.

by pressing the fruit, and collecting its ordinary juice, together with that which is lodged in the centre, and afterwards evaporating it, must yield an article of inferior and uncertain powers. Dr. Clutterbuck recommends the following method for preparing this medicine, and its superiority over the modes usually adopted is manifest.

"The cucumbers should be gathered when as nearly ripe as possible, and without violence, that might endanger their *bursting*. They should then be wetted by the affusion of cold water, that less of the juice, when they are cut, may adhere to the external surface. In this state they should be cut through longitudinally, and the juice allowed to strain through a fine sieve placed in a large earthen vessel. The seeds and surrounding pulp should be scooped out upon the sieve, and washed with repeated affusions of cold water, by which they will be freed from all adhering juice. Something will be saved also by afterwards rinsing the split cucumbers themselves in cold water, from which a portion of elaterium may be collected. After standing a few hours, a sediment is formed, from which the clear liquor is to be poured off; it is then to be thinly spread on fine linen, and exposed to the air to dry; a gentle warmth may be employed without injury; but the access of sunshine destroys the fine green colour which the substance otherwise acquires."*

Elaterium is a very ancient remedy, and was, for a long time, much esteemed as a hydragogue in hydropic diseases. In modern times it had, however, almost sunk into entire neglect, in consequence of its occasional harsh and violent operation, until it was again brought into notice as a remedy for dropsy, by Dr. Ferriar. It certainly is a medicine of exceedingly ac-

* London Medical and Physical Journal, July, 1819.

tive powers, and may readily do mischief if improperly administered. Elaterium, says Dr. Clutterbuck, is, with the exception of arsenic, perhaps, and the hydrocyanic acid, the most active article of the materia medica; and Dr. Ferriar observes, that "on its first exhibition to a patient, it is nearly as active and as dangerous, if incautiously given, as arsenic." It is, nevertheless, susceptible of such management in its administration, as to render it, not only a safe, but a most valuable remedy.

"Its powers," says this latter writer, "in removing serous accumulations in the cavities of the human body, surpass those of any other medicine; and the astonishing relief which it affords in the dyspnœa occasioned by hydrothorax or ascites, even in persons of the most advanced age, must place it in the first class of hydragogues." Dr. Clutterbuck also speaks in the highest terms of this remedy. "I know of no medicine," says he, "from which I have derived greater benefit, on various occasions, nor one in which greater confidence may be placed. Whatever can be accomplished in the cure of diseases, by active purging, may be effected certainly by this medicine."

The sensible effects of this substance, when given in a full dose, are, excessive nausea, copious and frequent watery stools; and if the dose be very large, vomiting, violent pains in the stomach and bowels, inflammation of these organs, spasms, and death. Along with its cathartic effects, it excites the action of the heart and arteries, even when given in moderate doses.

When prepared according to the method of Clutterbuck, one-eighth of a grain will be sufficient to produce violent purging. As it is usually met with in the shops, its dose is from one to two grains. It should, how-

ever, always be commenced with in a small dose, as, for instance, half a grain, and repeated every hour until the desired effects be produced. Dr. Ferriar states, that he generally gave it in union with some diuretic, when employed in dropsy, and commencing with a very small dose, sometimes carried to the extent of six grains a day.

The crystalline principle of Hennel, or *elaterin*, according to the experience of Dr. Duncan of Edinburgh, produces active purging when exhibited in the dose of one-twelfth or one-sixteenth of a grain. "The quantity of elaterin varies exceedingly, in different parcels of the drug. Mr. Morris obtained twenty-six per cent from the best British elaterium; fifteen per cent from the worst, and only five or six per cent from the French; while a portion procured according to the London College, yielded to Mr. Hennel upwards of forty per cent. This great diversity in the strength of elaterium renders the substitution of its purgative principle, or *elaterin*, highly desirable."*

Formulæ.

℞.—Ext. elaterii gr. iii.
Spir. nit. dulc. ℥ii.
Tinct. scillæ
Tinct. colchici āā ℥ss
Syrup. rhamn. cathart. ℥ss.—M. Chisholm has found this mixture highly serviceable in ascites. He gave a tea-spoonful every six hours. (Lond. Med. Repos. March, 1824.)

Or, according to Dr. Ferriar,

℞.—Extract. elater. gr. i.
Spir. nit. dulc. ℥ii.
Tinct. scillæ
Oxymel colchic. āā ℥ss.
Syrup. rhamni ℥i.—M. Take one drachm three or four times daily.

* United States Dispensatory.

℞.—Ext. elateri. gr. ii.
Pulv. sacch. alb. ʒi.—M. Divide into eight equal parts. Take one every fifteen minutes until purging is produced. (Braud. Mat. Med. p. 483.)

CROTON TIGLIUM.—CROTON OIL.

The oil which is obtained from the seeds of this plant, has been recently introduced to the notice of the profession, as one of the most active purgatives known. It is generally supposed to be a *new* remedy, but this is a mistake; both the seeds and oil were very early noticed and employed in medicine. Serapion the younger, mentions this plant and its seeds. (De Simplicibus, c. 261.) M. Pomet, chief druggist to Louis XIV. in his General History of Drugs, speaking of the seeds of Tiglium, says, "the use of these kernels is to purge, and it is indeed one of the greatest purgatives we have."* M. Lemary speaks of the oil of these seeds "as being capable of exciting purging, simply by rubbing the stomach and belly with it."† Rumphius, also, speaking of this plant, says, "Olim grana (tiglii), per totam Indiam Orientalem crebro in usu fuerat, ad lympham hydropicum per alvum, præprimis, eliminandam, in iis vero, quorum ventriculus debilis simul emesis subsequnta. Fortioribus bina grana sufficerunt, aliis granum unum cum semisse. Variis aliis in morbis in quibus purgantia fortiora opportuna videntur, ista in India adhibent. Et hanc quidem acrimoniam oles ipsi seminis inesse, tam ex dictis quam inde apparet, quod olei ex siccis granis expressi *gutta una* cum canariensi vino capta vulgare apud chirurgos in India degentes

* Medical Histories, vol. i. p. 46.
† Vide Mr. Iliff's Paper, in the 97th No. of the London Med. Repos.

purgans constituerit."* The seeds are also mentioned by Dr. Fleming in the 11th vol. of the Asiatic Researches, as having been formerly well known and employed in Europe as hydragogue purgatives. Bergius, Lour, Linnæus, and Burdach speak of the *grana* tiglii as powerfully purgative.

According to the experiments of Dr. Nimmo, alcohol of sp. gr. 825, dissolves only a portion of the oil. The part which remains undissolved, is destitute of the characteristic acrimony of the oil, "this property being entirely transferred to the alcoholic solution, which answers the medicinal properties of the entire oil in a more certain manner, and unattended by several inconveniences formerly experienced from its use." The oil contains forty-five parts of acrid principle, and fifty-five of *fixed* oil. The acrid principle is united with a resinous substance, which is dissolved by alcohol, sulphuric æther, volatile and fixed oils.† The oil itself is converted into a saponaceous mass by means of an alkali.

This oil is powerfully purgative. Given in the dose of from one-half to one drop, it produces copious evacuations. Mr. Iliff, apothecary to the South London Dispensary, whose experience with this remedy has been very extensive, thinks, however, that it produces nausea and griping more frequently than has been supposed; nor does it appear to be uniformly certain in its operation. Mr. Iliff states, that he gave nine drops in a case of apoplexy, in three drop doses, without any operation whatever; whereas, ten grains of calomel, which was afterwards resorted to, acted briskly.‡ This

* Vide Medico-Chirurgical Review for Sept. 1821. Rumphius Herb. Amboininu, tom. iv. p. 98.

† London Medical Repository, vol. xvii.

‡ Ibid.

accords with my own experience; and it is now pretty generally admitted to be uncertain in its operation, causing copious discharges in some instances, whilst in others it operates very imperfectly, giving rise to small mucous stools, and extremely severe tormina. I have myself taken it twice; in both instances it operated but sparingly, and left a considerable feeling of soreness throughout the abdomen. There are, nevertheless, some writers who speak favourably of its powers as a purgative. We have the testimony of Dr. Carter, one of the physicians of the Kent and Canterbury Hospital, in favour of the employment of this article as an active purgative. He says that he employed it in seventeen cases, in one of which only did it fail to operate. Croton oil has been sucessfully used in maniacal cases. Sir George Tuthill, one of the physicians to Bethlehem Hospital, has found it beneficial in affections of this kind. It has also been used with advantage by Dr. Pearson;* and it is said to be an excellent hydragogue, and to have proved very serviceable in hydropic cases. Professor Francis, of New York, states in a letter to me, that "he is induced to pronounce the oil of croton a powerful and certain and speedy purgative, and free in its action from griping. In a case of most obstinate and very long continued costiveness, he says, it effected what neither the elaterium, nor the other vegetable drastics, nor mercury could accomplish." He thinks it will be found peculiarly serviceable in habitual torpor of the intestinal canal.

This oil appears to make a very powerful and prompt impression on the nerves. The editor of the London Medico-Chirurgical Review† says, that "cases of tic

* A Sketch of the Botanical Literature, &c. of Croton Tiglium. By John Frost, Esq. See London Med. Repos. July, 1822.

† No. vi. p. 428. New Series.

doloureux have been lately relieved, and even removed, by a drop or two of oil of croton applied to the tongue. The effect on the nerve was almost instantaneous." Mr. Frost says, that he has seen instances in which the application of this oil to the tips of the fingers "produced a sense of numbness in the fingers, hand, and arm (but no local inflammation), dryness in the throat, and headach, which continued for several hours." It generally, however, produces a very considerable degree of local inflammation when applied externally.

It may be conveniently given in the form of pills, made with the oil and crumbs of bread.

The violence of the action of this oil may be lessened by giving it in union with some aromatic, and particularly with any of the volatile oils: viz. oleum caryophillorum, cinnamoni, &c. Roasting, or baking the seeds, previous to extracting the oil, is said also to lessen the violence of its action. The vegetable acids are likewise said to moderate its action.* Dr. Frost recommends the following formulæ for exhibiting this oil.

Formulæ.

℞.—Ol. expres. sem. croton gtt. i.
Ol caryophill. gtt. i.
Confec. rosar. gr. iv.—M. Form into a pill.

℞.—Extract jalapæ aquos. gr. ʒss.
Ol. croton gtt. 3.—M. Divide into ten pills. Take two every hour until they operate.

℞.—Olei. croton tiglii gtt. ii.
Saponis albi. gr. ii.
G. arab. q. s.—M. Divide into four pills. Take two pills. (*Tavernier.*)

OLEUM RICINI.—CASTOR OIL.

This oil is obtained by expression, or decoction, from the seeds of the *Ricinus communis*, a plant which

* Lond. Med. Repos. June, 1822.

grows wild in the East and West Indies, and in some parts of South America, and which is now cultivated in this country.

It is a yellowish or colourless oil, possessing a faint, peculiar, sweetish taste, and scarcely any odour. On being swallowed it excites an unpleasant acrid burning in the throat and fauces, which, however, is but very slight when the oil is fresh and entirely free from rancidity. It is wholly soluble in alcohol and sulphuric æther; and mixes more readily with caustic ley than any other oil. These circumstances distinguish it from the other fat oils, and enable us without difficulty to detect its adulterations.

Castor oil is a very mild, unirritating, but certain and prompt cathartic, procuring copious fæcal evacuations, without appearing to excite the intestinal emunctories, since it hardly ever occasions any very liquid or watery discharges. Where we wish simply to evacuate the contents of the bowels, or avoid costiveness, there is no article belonging to this class of remedies so well adapted as castor oil to answer our intentions. Independent of the mildness and completeness of its operation, it is less apt than any other cathartic to leave the bowels in a dry or costive condition.

In cases of obstinate constipation, castor oil, though often insufficient, by itself, to procure adequate evacuations, acts, in general, with much advantage when given some hours after the exhibition of a full dose of calomel, or calomel and jalap.

No laxative is more commonly employed in the treatment of dysentery than this one; and when the stomach can bear it, it is, without doubt, a very important remedy. "Oleum ricini," says Dr. Bampfield, "is, perhaps, better calculated to afford relief in dysentery than

any other aperient or cathartic; for its action is not only mild and generally effectual, but I have observed that some of it passes undecomposed, in its oily form, through the intestines, and appears on the surface of the excrement, and hence may serve as a sort of sheather or defence to the diseased intestines, from the stimulus of fæces and morbid secretions."

A common mode of prescribing it in this disease, when there is much tenesmus and griping, is in union with a full dose of laudanum. Given in this way it is much less apt to be rejected by the stomach, and it moreover mitigates directly the sufferings of the patient, and loses but very little of its aperient effects.

Castor oil has also been much recommended in the treatment of colica pictonum. It is particularly useful in this disease to put the bowels in motion, after large doses of calomel and opium have been administered.

In the form of an emulsion it is a very excellent aperient for children.

Castor oil has also been highly recommended as a remedy for the expulsion of the tape-worm. Dr. Odier, of Geneva, and Dunant, employed it with much success in expelling the *unarmed tænia*,* and Brera states that "it sometimes serves wonderfully well to expel also the armed tænia."† After having previously administered three drachms of powdered *male fern*, Odier gave the ol. ricini by table-spoonfuls every half hour until full purging is induced. Brera, however, recommends it to be given to the extent of three ounces for a dose. "In my journal," says he, "I have two cases of armed tæniæ expelled by three ounces of this oil, taken by a patient

* Manual de Medicine-Pratique, par L. Odier, p. 225.

† Treatise on Verminous Diseases, by V. L. Brera, professor of clinical medicine at Pavia, p. 234.

during three successive days, and by another taken twice a day for a week."

The celebrated S. G. Vogel has introduced a composition which strongly resembles castor oil, and which forms an excellent substitute for it when it is rancid. It consists of nine grains of resin of jalap, three grains of Venitian soap, to be triturated in a mortar, with an ounce and a half of oil of olives. The dose is a table-spoonful. Dr. Schmitman speaks very highly of this mixture in dysentery. He says it always allays the pain and severe excitement of the intestines, but at the same time gently and completely evacuates their contents.* An ounce of castor oil is a full dose for an adult. It may in general be more conveniently taken in hot milk than in any other way.

Formulæ.

The following is an excellent mode of exhibiting castor oil where there is much griping and tenesmus in dysentery.

℞.—Ol. ricini ℥i.
Vitel. ovi q. s. tere simul et adde,
Syrupi papaveris ℥ii.
Tinct. opii gtt. xviii.
Aq. fontanæ ℥iss.—M. ft. haustus. To be taken at once.

For children the following emulsion will be found convenient:

℞.—Ol. ricini ℥i.
Sacch. alb. ℥i.
Album ovi q. s. tere simul et adde, gradatim,
Aq. menthæ ℥ss.
Aq. fontanæ ℥ii.—Dose for a child one year old, a tea-spoonful every hour.

℞.—Magnesiæ alb. ℥ss.
Ol. ricini ℥i.
Syrup. limonis ℥ss.—M. First triturate the oil and magnesia together, then add the syrup. This forms an elegant and highly useful purgative for young children.

℞.—Ol. ricini ℥ii.
Syrup. rhæi ℥iv.—M. Dose, a tea-spoonful for an infant.

* Summa Observationum Medicarum, &c.

SULPHUR SUBLIMATUM.

The sulphur of commerce is extracted from pyrites by sublimation. In volcanic districts, it is occasionally found in a perfectly pure and crystallized state; and it exists in a combined state in some animal and vegetable substances. It is insoluble in water and alcohol, but perfectly soluble in both the essential and fixed oils. Linseed oil is one of its most powerful solvents.

Sulphur was much esteemed for its medicinal powers by the ancients, and continues to this day to hold a very important rank among the articles of the materia medica. When taken in the dose of from one to two drachms, it acts as a mild and pretty certain laxative, producing one or two copious evacuations, without either heating the system or griping the bowels. "These circumstances," says Dr. Cullen, "render it a most proper and convenient laxative; and were it not for the fœtor that sometimes attends its operation, and is ready to be diffused in the air around, sulphur would be one of the most agreeable laxatives that could be employed."

Sulphur, when taken into the alimentary canal, appears to pass with facility into the circulation, as is evinced by the sulphurous odour which the breath and cutaneous exhalation of those who take sulphur soon acquire; and also by the black colour which polished metals, carried in the pockets of such persons, are apt to contract.

As a purgative, sulphur seems to direct its action

more especially upon the lower portion of the bowels, and to excite the activity of the circulation in the portal system of vessels. It has been accordingly much recommended in hæmorrhoidal affections, more, however, with a view of obviating than of removing the disease. With the view of keeping up a regular action of the bowels, so as to procure one or two soft stools daily, without actual purging, this article, in combination with cream of tartar, or with magnesia, will, in general, answer an excellent purpose, in slight cases of this affection. In bleeding piles, however, and where much inflammation or ulcerated fissures exist, sulphur is by no means a proper remedy, and ought to be wholly abstained from. Its usefulness is, in a great degree, confined to the hæmorrhoidal habit, with a tendency to constipation, with the view of preventing congestion in the portal vessels, and the consequent formation of varicose hæmorrhoidal tumours.

The most important medicinal powers of this substance are, however, those which it possesses against various obstinate diseases of the skin. Alibert considers it as the most efficacious article we possess in affections of this kind. "I have used sulphur a great deal in my practice," says he, "and have removed cutaneous eruptions with it, that had resisted all the other means known." It is observed by the same author, that persons whose employment exposes them much to the fumes of sulphur, are never affected with chronic cutaneous eruptions. He considers it as particularly efficacious in the cure of herpetic diseases. For the cure of tinea capitis, too, he thinks that there is no remedy superior to the unguentum sulphuris. I have, however, employed the kali sulphuratum, according to the pre-

scription of Barlow,* with much better effect than the simple sulphur ointment.

For the cure of psora it is a very common remedy. I have found Jasser's ointment, as it is altered in the Prussian Pharmacopœia, a very useful remedy in this disagreeable affection.†

For the cure of psora in children, Dr. Clark, of Dublin, recommends a lotion, made by pouring a quart of boiling water on an ounce of broken sulphur, and suffering it to infuse for twelve hours. In this process, says Dr. Paris, the water probably takes up a small portion of sulphurous acid.

Munro speaks very favourably of a union of sulphur and crude antimony in chronic rheumatism; and Schaeffer, (Hufeland's Journal,) strongly recommends a combination of magnesia, sulphur and nitre, in rheumatic affections of the internal organs, particularly of the stomach. Hufeland asserts that he has succeeded in keeping off the attacks of gout for years, by the use of sulphur and gum guaiacum, given in combination, and in doses sufficient to procure two or three alvine evacuations daily, repeated three or four days in succession, once every month. (Journal B. 14, St. 1, p. 181.)

Sulphur has also been much praised as a remedy in gout and rheumatism. Barthez, in particular, commends its powers in the former of these diseases; in the chronic form of the latter, I have, in several in-

* ℞.—Kali sulph. (recen. preperat.) ʒiii.
Sapo hispan. ʒi.
Aq. calcis ℥viii.
Spir. vin. rect. ʒii.—M. fiat lotio. Wash the head morning and evening.

† ℞.—Flor. sulphuris ℥ii.
Sulp. zinci. ℥ii
Ol. lauri. auxung. porcin. q. s.—M. ut fiant unguent.

stances, derived great advantage from the employment of sulphur, in combination with guaiacum. Its beneficial operation in these diseases is, no doubt, mainly dependent on its tendency to excite the cutaneous exhalents, and to equalize the general circulation.

Wedekind, a German physician, of celebrity, speaks very favourably of the employment of sulphur, in the dose of twenty grains, with double the portion of gum arabic, in the cure of dysentery. "The bloody discharges," he says, "together with the tormina and tenesmus, often cease as soon as a few doses of this medicine have been administered."* Sulphur has also been recommended in amenorrhœa. Richter observes, that it is especially useful in cases where the menses are suddenly arrested during their flow, by cold or violent mental emotions; and in deficient menstruation with torpor of the bowels, much benefit may sometimes be derived from its use, provided the general habit be not phlogistic.†

Werlhof recommends the internal employment of sulphur as a valuable remedy for the anasarca, which is sometimes the consequence of scarlet fever.

In certain chronic pectoral affections, also, much advantage may sometimes be obtained from the employment of sulphur. In chronic catarrh, attended with a copious expectoration of a muco-purulent matter, I have derived great benefit from the mixture recommended by Engelhard,‡ according to the first formula mentioned below. The preparation so highly recommended by Dr. Hoffmann, may also be used with peculiar advantage in chronic bronchitis. Formerly, I

* Burdach's Arzneimittellehre, Bd. 111, p. 14.

† Richter's Ausführliche Arzneimittellehre, Bd. 3, p. 423.

‡ Die lungens. in ihr vershid. formen und Zeiträumen, p. 97.—1823.

was much in the habit of employing this combination, and occasionally with the most decided benefit. See formula No. 2. Kopp speaks greatly in favour of a union of sulphur and the extract of belladonna in hooping-cough; and Randhahn (Rust's Mag. Bd. 24, p. 493), prescribed in this affection, a combination of sulphur and ipecacuanha, in the proportion of four grains of the former to two grains of the latter, two or three times daily, with much benefit. Herholdt, Garnett, and Hoffmann, recommend the use of sulphur and pulverized charcoal in chronic pulmonary catarrh.

Sulphur has also been especially recommended in various blenorrhagic, or chronic mucous discharges. Hermann asserts that he has known the internal use of sulphur to produce the happiest effects in morbid mucous discharges from the bladder and vagina.* Pitschaft, an eminent German writer of the present day, states, that in catarrh of the bladder, he has derived important advantages from the employment of a drachm of the flowers of sulphur with two grains of calomel, twice daily. (Hufeland's Journal, Bd. 49.)

Sulphur is, by many, supposed to have the property of diminishing the salivant effects of mercury, and it is accordingly a good deal prescribed for the purpose of moderating ptyalism. I do not believe, from what I have observed in my own practice, that it possesses any virtues in this respect beyond what may be ascribed to its diaphoretic operation.

Formulæ.

No. 1. ℞.—Extract. hyoscyam.
Flor. sulph.
Extract. glycyrrh. āā ʒi.—M. Eight grains of this mixture is to be taken three times daily.—*Englehard.*

* System d. praktischen Heilmittill, Bd. 2. p. 89.

No. 2. ℞.—Ol. amygdalar. dul. ʒii.
Flor. sulph. ʒii. Boil them gently, until the sulphur and oil are completely united; then add, still keeping it at a boiling heat,
Bals. copaib. ʒi.
Ol. anise gtt. xx.
Spermæceti ℈iv.
Syrup. papaveris ʒss.—M. Dose, a drachm three or four times daily.—(*F. Hoffmann.*)

Pulvis liquiritiæ compos. Pharm. Boruss.

℞.—Pulv. rad. glycyrrhiz. ʒi.
Pulv. fol. sennæ
Pulv. sem. anise
Flor. sulph. āā ʒi.
P. sacch. albi. ʒiv.—M. This mixture is said to be an excellent medicine in catarrhal affections. If febrile irritation attends, half an ounce of powdered nitre should be added. The dose is a tea-spoonful three or four times daily.

℞.—Phos. sodæ
Magnes. carbon.
Flor. sulph.
P. sem. fœnicul. āā ʒii
P. camphoræ gr. xvi.—M. Divide into sixteen equal parts. One to be taken every three or four hours until the bowels are moderately moved, in hæmorrhoidal affections.—*Richter.*

Other formulæ, for the internal use of this article, are given in the second volume, in treating of sulphur as a diaphoretic.

MAGNESIA.

Nature no where presents us with this substance in a pure state. It is commonly found in combination with sulphuric acid, from which it is separated by precipitating it from its solution by potash.

Magnesia is a white and very light earthy substance, having a specific gravity of 2.3. It converts very delicate blue vegetable colours to green; is very sparingly soluble, requiring two thousand times its weight of water to hold it in solution. The solutions of alkaline

carbonates dissolve it; but those of the caustic alkalies have no action on it. It increases the solubility of camphor, opium, and resins in water.* It combines with sulphur.

This substance was, for a long time, sold in Italy as a secret remedy, under the name of magnesia alba, or Count Palma's powder; and it was not until about the middle of the last century that it was introduced into practice as a regular remedy. At present it is much employed as a mild aperient, both in its pure state and in that of a carbonate.

As a laxative, magnesia is by no means uniform or certain in its operation. Its purgative effect depends, in a very considerable degree, on the presence or absence of acid in the primæ viæ. When the stomach is free from acidity, it seldom produces free evacuations, unless given in very large doses,—whilst even moderate doses often operate promptly and pretty actively when it meets with acid in the stomach. This circumstance renders it peculiarly serviceable where an acid exists in the primæ viæ. It unites with the acid, and, acquiring thus the character of a neutral salt, acts with greater energy as a purgative. If the carbonate of magnesia be employed under such circumstances, the acid in the stomach, uniting with the magnesia, evolves a considerable portion of carbonic acid gas, and may thus create painful flatulent distentions. This effect is obviated by using the pure magnesia, instead of the carbonate. Magnesia is particularly valuable as a laxative for infants, affected with acidity of the primæ viæ, flatulency, and colic. The usual mode of prescribing it in the gastric complaints of infants, is to unite it with a few grains of rhubarb. I have generally given it in

* Paris's Pharmacologia.

combination with rhubarb and powdered valerian, in the proportion of three grains of the two first with two grains of the valerian. In weak and nervous subjects, the magnesia may be very beneficially given in union with rhubarb and powdered orange peel. This combination is particularly useful in relaxed and hysterical females. A mixture of an ounce of magnesia with a drachm of rhubarb, and the same quantity of orange peel, is recommended by Richter in such cases—in teaspoonful doses until the bowels are freely moved.

When in the advanced stage of low fevers, or during convalescence, symptoms of acidity in the stomach manifest themselves, the union of gentian, ammonia, and magnesia, is, according to Mr. Brand, an excellent remedy. Half a drachm of the magnesia, with the same quantity of aqua ammonia and ten drachms of the infusion of gentian may be given at one dose. (Mat. Med. p. 157.)

Magnesia has been much commended for its good effects in gout. Dr. Scudamore,* however, states his conviction, that its use in this disease is derived solely from its qualities as an antacid and purgative; and that in no other way than by such influence on the stomach and alimentary canal, can he consider it as having any claim to our regard.

In cases of dyspepsia, attended with an acid in the stomach, magnesia may be advantageously united with aromatics and some of the milder tonics. In this way we not only remove the morbid contents of the stomach, but at the same time also invigorate this organ, and thereby counteract the new formation of the acid.

Used simply as an absorbent or neutralizer, magnesia is highly useful in all affections attended with morbid

* Treatise on the Nature and Cure of Gout, &c. p. 278.

acidity of the stomach. In the griping bowel complaints of children, attended with green or sour stools, magnesia is much employed, in which it is, indeed, a very useful remedy. For this purpose, the prescription given below is a very convenient form of exhibiting it.*

In dyspepsia, attended with acidity in the primæ viæ, pain and flatulency, Dr. Johnson highly recommends a mixture composed of half a drachm of the carbonate of magnesia, a drachm of the aromatic spirit of ammonia, half an ounce of the tincture of rhubarb, and half a drachm of the tincture of hyoscyamus, with four ounces of water, in table-spoonful doses, two or three times daily.† I have, myself, employed this mixture with very excellent effects in cases of this kind. Richter speaks very favourably of the employment of magnesia, in union with lac sulphuris, in doses of twenty grains of each, twice daily, in acidity of the stomach attended with flatulent pains in the abdomen. (Spec. Therap. B. 4, p. 92.)

Magnesia has, of late, been recommended as a very useful remedy to prevent the too copious secretion of uric acid by the kidneys, and consequently, to obviate the formation of those urinary calculi which are chiefly or wholly composed of this acid.‡

Mr. Brande has published some very interesting experiments and observations on the comparative value

* ℞.—Magnes. calc. ʒss.
Pulv. rhei. gr. viii.
Sacch. alb. ʒi.
Pulv. g. arab. ʒss.
Aq. menth. ℥ss.
Aq. fontanæ ℥i.—Misce. Dose, a tea-spoonful.

† Essay on the Morbid Sensibility of the Stomach.

‡ Brande on Calculous Disorders, in the Philos. Trans. 1810, p. 1.

of magnesia and alkalies in calculous affections. Sir E. Home had suggested the superiority of the former over the latter, on the ground of its possessing less solubility, and being, therefore, more apt to remain longest on the stomach, and to counteract the formation of uric acid. The correctness of this suggestion, so far as regards the fact, was confirmed by the experiments of Mr. Brande. Dr. Scudamore admits the fact of its superiority over the alkalies; but he ascribes it chiefly to its purgative qualities, by which the acid of the stomach is not only neutralized, but also carried out of the body. Dr. Marcet,* on the contrary, contends, that the alkalies are superior to this article as a means for correcting the lithic acid diathesis; but the inference to be drawn from these contradictory statements is, that there is no certain appreciable difference between magnesia and the alkalies in this respect, except what may arise from the purgative powers of the former, or accidental circumstances.

Magnesia has, of late years, been strongly recommended as a remedy in diabetes. Trotter asserts, that he succeeded in curing two cases of diabetes mellitus by the use of half a drachm of carbonate of magnesia four or five times daily. Haase also speaks very favourably of this article in diabetes. (Chron. Krank. v. 3.)

Magnesia may be conveniently given in union with other purgatives. It is frequently united with lac sulphuris; in which combination it is said to be particularly useful in bilious complaints. The dose of the carbonate, for an adult, is from twenty to sixty grains. Infants may take from two to five grains.

It ought to be observed, that from a considerable

* An Essay on the Chem. Hist. and Med. Treat. of Calculous Affections.

number of authentic cases reported in the journals within the last ten or twelve years, it would appear that the long use of magnesia produces sometimes enormous and dangerous accumulations of this substance in the large intestines.

In the Journal of Science and the Arts, No. xi. Mr. Brande has given an account of two cases, "in which the long continued use of magnesia was productive of a concretion of this earth in the bowels, in an immense quantity," and which "gave rise to many of the worst symptoms attendant on an obstruction of the intestinal canal." In the second case, it is stated that "not only large quantities of a concretion of a similar description were voided, but upon examination after death, which took place perhaps six months after any magnesia had been taken, a collection, supposed to be from four to six pounds, was found embedded in the head of the colon, which was, of course, much distended." Cases similar to these have since been published by other physicians.

Carbonate of magnesia has been much recommended by some late writers as an antidote. Mr. Marshall* mentions this article as one of the most valuable remedies, in cases of poisoning from arsenic. Mr. Hume, also,† speaks highly of its effects in this way. He relates a case of poisoning by arsenic, of a very hopeless character, which was cured by the composition given below.‡ Orfila, from some experiments made

* Remarks on Arsenic.

† London Medical and Physical Journal, Nov. 1821, p. 466.

‡ R.—Magnes. carbonatis ℥i.
Aquæ distillæ ℥xv.
Vini opii ℥iss.
Spiritus lavand. comp. ℥iii.
Sacchari albi ℥ss.—M. Capiat æger cochlearia duo magna frequenter, phialâ assidué agitatâ.

with this article as an antidote, concludes, that magnesia is decidedly the best medicine in poisoning from sulphuric or nitric acid.

Formulæ.

℞.—P. rad. valerian ʒi.
P. rad. ireos florent. ʒiss.
P. rad. liquir. ʒii.
P. sem. anise ʒss.
Magnes. carbon. ʒi.—M. ft. pulv. From six to eight grains of this may be given to an infant twice or thrice daily. (*Hufeland.*)

℞.—Magnes. alb. gr. xii.
Sacch. alb. ʒii.
Aquæ fontanæ ʒi.
Tinct. opii gtt. iii.—M. Dose, a tea-spoonful for an infant every two hours, until relief is obtained. (*Dewees.*)

NEUTRAL SALTS.

SULPHAS SODÆ.—GLAUBER'S SALTS.

This salt is one of the most common and useful purgatives we possess. In general the saline cathartics are preferable to any of the other purgatives in diseases of a decidedly phlogistic character, on account of their tendency to moderate febrile irritation by their general antiphlogistic influence, as well as their aptitude to increase the renal secretion. The operation of this, as well as of the succeeding article, appears to be principally directed upon the small intestines, giving rise to free liquid evacuations; and hence it seldom answers well for the removal of the loaded or infarcted state of the lower portion of the bowels, so common in chronic affections. In plethoric, robust, and irritable habits, and in acute inflammatory or congestive affections,

particularly of the head, such as a tendency to apoplexy, ophthalmia, encephalitis, and in the exanthematous and other general febrile diseases, the sulphates of soda and magnesia are peculiarly valuable purgatives. They cannot, however, in general, be so properly used in chronic affections attended with general languor and weakness, unless some local inflammation or high irritation exists, as is often the case in leucorrhœa. This salt consists of 24.64 parts of sulphuric acid, 19.36 of soda, and 56 of water. It crystallizes in transparent six-sided prisms, terminated by dihedral summits. When exposed to the air, it effloresces. It possesses a saline and disagreeable bitter taste. One ounce of water at 60° dissolves ʒiiiss. of the salt; boiling water dissolves it in much greater proportion; in alcohol it is quite insoluble. It is decomposed by the *muriates of ammonia*, *baryta*, and *lime; nitrate of silver; subacetate* and *acetate of lead.*

The dose is from ʒss. to ʒii; when administered in lemonade, or with the addition of a small portion of cream of tartar, it is much less disagreeable to the taste.

It does not appear to be generally known that Glauber's salt is much more active in the *dry and effloresced*, than in the crystallized state. Half an ounce of the former will, in general, operate as promptly and actively as an ounce of the latter. Richter, however, says that the effloresced is not so *certain* in its purgative effects as the crystallized salt; but I have not noticed any difference between them in this respect. Glauber's salt may be very advantageously given, in small doses, united with tartar emetic, as an antiphlogistic aperient in febrile complaints. An ounce of the salt with half a grain of tartar emetic dissolved in a pint of water, may be

used in table-spoonful doses every hour until the bowels are pretty freely moved. The French call this combination *sel de Guindre*. When the febrile excitement runs high, a portion of nitre may be very appropriately added.

SULPHAS MAGNESIÆ.—EPSOM SALTS.

This is also a very common and useful purgative. It consists of small, needle-like, tetrahedral prisms; possesses a bitter taste, and is soluble in its own weight of water at 60°. When pure, it effloresces on being exposed to the open air. It is decomposed by "baryta, strontia, the alkalies, and all the salts formed by these salifiable bases, excepting the alkaline muriates; and by the nitrate, muriate, and carbonate of lime." The addition of a little common salt is said to increase its purgative powers, and a small portion of tart. antimony quickens its operation. The dose is from ℥ss. to ℥ii. The sulphates of magnesia and soda differ but little in their effects. Being less apt to heat the system than the other active articles of this class, they are more particularly applicable to the treatment of febrile diseases. Given with a minute portion of antimony, according to the directions of Sir Gilbert Blane and Dr. Chisholm, they are exceedingly useful in the beginning of bilious fever. A solution of ℥ii. of either of these salts, with gr. ii. of tart. antimony, in a pint of water, may be very usefully given in the beginning of such fevers, in doses of a wine-glassful every hour, until vomiting and full purging is produced.

The sulphate of magnesia is, in general, less apt to be rejected by the stomach than the sulphate of soda,

and it is, on this account, best suited to cases attended with morbid irritability of the stomach. It has been said that Epsom salt has a peculiar power of moderating gastric pain, independent of its cathartic effects. Exhibited in small and frequently repeated doses, its effects have been particularly extolled in ileus and colica pictonum. According to Orfila, the sulphates of magnesia and soda are peculiarly useful as purgatives in poisoning by sugar of lead, and Buchner in his valuable work on Toxicology, makes the same statement, from facts which had come under his own observation. A solution of this salt in lemonade is a very convenient and efficacious laxative in the diseases of very young children.

The sulphate of magnesia is particularly recommended by Mr. Brand, for the purpose of obviating habitual costiveness. It must be given in small doses and in union with some bitter tonic infusion. Thus, half a drachm of the salt, dissolved in six drachms of the infusion of gentian, with one drachm of ginger syrup, and ten drops of elixir of vitriol, taken an hour before eating at noon, will seldom fail to procure an alvine evacuation towards evening.

SULPHAS POTASSÆ.—VITRIOLATED TARTAR.

This salt crystallizes in small, transparent, hard, six-sided prisms, terminated by six-sided pyramids. It is bitter, and dissolves slowly in water, requiring ℥i. of water at 60° to dissolve twenty-four grains of the salt; in alcohol it is quite insoluble. It consists of 32.8 acid, 67.2 of potass and water. The barytic salts, the nitrates and muriates of strontia, and lime, decompose

this salt; it is *partially* decomposed by the tartrates and the salts of mercury, silver, and lead.

Sulphate of potass acts as a gentle aperient, when given in doses of about twenty or thirty grains. In the dose of from ʒv. to ʒvi. it acts as a mild cathartic, though, on account of its difficult solution, it acts much slower than the two preceding salts. It appears to be more apt, when given in aperient doses, to debilitate the digestive organs than any other of the saline purgatives. It does not excite the intestinal exhalents so much as the sulphates of soda and magnesia, and in general it procures more consistent stools than the other salts. It is, however, very rarely employed with a view to its purgative effects, except in combination with other articles, when it constitutes a minor ingredient. In union with opium and ipecacuanha it forms the well known and excellent diaphoretic preparation, *Dover's Powder*. The formula for this preparation is given under the head of *ipecacuanha*.

SUPER-TARTRAS POTASSÆ.—CREMOR TARTAR.

This is a bi-tartrate, having two proportionals of acid, and one proportional of potass. As it occurs in commerce, this salt is always mixed with a portion of the tartrate of lime, "amounting on an average to six, and occasionally even to fourteen per cent. It is but sparingly soluble, requiring for its solution one hundred and twenty parts of water at 60°, and thirty parts at 212°. By long keeping, the watery solution of cremor tartar undergoes decomposition, depositing a mucous matter, and leaving "a solution of carbonate of potass, coloured with a little oil."* The solubility of cremor

* Paris's Pharmacologia.

tartar is greatly increased, by combining it with boracic acid. The alkalies, alkaline earths, and mineral acids decompose it.

Cremor tartar is, for many purposes, an exceedingly useful purgative. It is a mild, cooling, and certain laxative, exciting the intestinal exhalents to a copious effusion of serous fluid, and producing at the same time pretty strong diuretic effects. It possesses, however, a very considerable tendency to weaken the digestive functions; and this circumstance, together with its strong powers of exciting copious serous evacuations, renders it an improper aperient for dyspeptic patients, or such as are of a relaxed and debilitated habit, with a sluggish state of the circulation, and an aptitude to gastric pains, flatulency, and acidity. In certain dropsical affections, however, it may be accounted among the most valuable remedies we possess; and there are, in fact, but few hydragogues which have been so generally employed and recommended for the cure of ascites and anasarca, as this article. It is more especially, however, in cases of dropsy, connected with manifest general irritation of the sanguiferous system, that cream of tartar is apt to prove serviceable. In the more relaxed, languid, and debilitated cases, it answers best when given in combination with powdered squill and gamboge. Dr. Ferriar gives an account of forty-three cases of dropsy treated by cream of tartar, of which thirty-three were effectually cured. He says: "I think we may fairly rank this medicine in the first class of hydragogues."* Dr. Home also speaks much in favour of its effects in dropsical diseases.† In my own practice I have often derived the most decided advantage from this remedy in the treatment of ascites.

* Medical Histories and Reflections, p. 46.

† Clinical Observ. Exper. &c. p. 349.

Among the German writers of eminence we may cite, in favour of the especial usefulness of this saline hydragogue in hydropic affections, the names of P. Frank, (Epitom. vol. v. p. 189,) Jahn, (Chronish. Krank. t. i. p. 114,) Rahn, Lentin, (Beitrag. B. i.) and Richter.

Cream of tartar may be very beneficially united with gamboge and tartar emetic as a hydragogue in dropsical affections. But the most efficient of all the hydragogues I have ever used in dropsy, is a mixture of cremor tartar, tartar emetic, pulv. scillæ, and sulphate of potash, according to the formula No. 1, annexed.

Cream of tartar has been a good deal extolled for its power in removing obstinate constipation. In union with jalap, it will often excite the action of the intestines, after the most powerful cathartics have been given in vain.

In the dose of ʒiv. or ʒvi. it acts as a hydragogue cathartic; in smaller doses it produces diuretic effects. A very pleasant aperient beverage may be made by dissolving about ʒi. of this salt in a pint of hot water, and flavouring it with lemon-peel and sugar.

This article may also be employed with peculiar advantage in the early periods of *disease of the hip joint.* Dr. Physick has been long in the habit of prescribing cream of tartar, in union with powdered jalap, in this affection, and the experience of other practitioners in this country has fully confirmed its usefulness.

Hufeland asserts, that he has found no remedy so beneficial in the vertigo of old people as a mixture of cream of tartar and gum guaiacum, in doses of half a drachm of each twice daily. In the vertigo of young persons from vascular congestion of the brain, he employed magnesia and cream of tartar with great advantage. (Jour. B. 3.)

Formulæ.

No. 1. ℞.—Crem. tartar. ℥iss.
Sulphat. potass. ℥ss.
Pulv. scillæ ʒii.
Tart. emetic. gr. iii.—M. A tea-spoonful to be taken three or four times during the day.

No. 2. ℞.—Crem. tartar. ℥ss.
Sacch alb. ʒiv.
Cort. limon. recen. ℥ss.
Aq. fervid. ℔. iv.—M. This is an excellent cooling aperient beverage.—(*Brand.*)

CREMOR TARTARI SOLUBILIS.

The union of boracic acid and cream of tartar forms a soluble salt, possessing the sensible and medicinal properties of the latter article. The precise chemical constitution of this combination does not appear to be as yet well determined. According to Berzelius it consists of one part of borate of soda (one part of soda to six parts of boracic acid), and two parts of super-tartrate of potass (one part of potass and six parts of tartaric acid.) This salt may be made in various ways. The following mode for preparing it is given in the *Codex Medicamentarius* of Paris. "Let thirty parts of boracic acid and twenty parts of distilled water be heated together in a silver dish; as soon as this has been effected, add in divided portions one hundred and twenty parts of super-tartrate of potass, taking care to shake the mixture continually; the whole will soon liquefy, and by continuing the heat a pulverulent mass will result."

This combination appears to possess more active diuretic properties than the simple cream of tartar; and it is said to be an excellent aperient in chronic complaints, particularly in jaundice, chlorosis, hæmor-

rhoidal affections, and in chronic gastric affections with deranged action of the liver, &c. Richter states that this salt is peculiarly beneficial as an aperient in hysterical and hypochondriacal affections; and Bang asserts that it is a better remedy in dropsy than the super-tartrate of potass. (Acta Reg. Societ. Med. Hafn. t. iii.) Selig also mentions it as pre-eminently beneficial in hydropic affections. He gave it according to the formula, No. 1. As a laxative, the dose of this salt is one ounce. As a resolvent, it is given in doses of from twenty to thirty grains every two or three hours.

Formulæ.

No. 1. ℞.—Crem. tart. solub. ℥i.
Æther muriatic. ʒii.
Oxymel scillæ ℥i.
Aq. menth. ℥viii.—M. Dose, two table-spoonfuls every two or three hours. (*Selig.*)

No. 2. ℞.—Extract. taraxac. ʒiv.
Ext. cheledonii ʒi.
Crem. tart. solub. ʒvi.
Aq. fœnicul. ℥vi.—M. Dose, a table-spoonful every two or three hours. (*Richter, Arzneimittel.*)

TARTRAS POTASSÆ.—SOLUBLE TARTAR.

This salt consists of one atom of acid and one of potass. It is soluble in its own weight of water when in a crystallized state; but when it is in the form of small grains, as it is commonly met with in the shops, it requires four times its weight of water for its solution. Alcohol dissolves it very readily. It is decomposed by magnesia, baryta, lime, and strontia; the sulphates of potass, soda, and magnesia, and the muriate of ammonia decompose it partially. It is also entirely or partially decomposed by all acids; "and hence it is improper to join it with tamarinds or other acid fruits, as is too

often done in the extemporaneous practice of those physicians who are fond of mixing different cathartics together, and know little of chemistry."*

Soluble tartar, given in the dose of from thirty to sixty grains, acts as a mild and unirritating aperient. In the dose of ʒvi. or ʒvii. it acts pretty strongly as a cathartic. It is commonly employed in conjunction with senna or the other resinous cathartics, with a view of correcting their griping qualities. Soluble tartar has been much recommended as an aperient in maniacal affections. It has also been recommended in dropsy and jaundice.

CALOMEL, OR SUBMURIATE OF MERCURY.—MILD CHLORIDE OF MERCURY.

Calomel is unquestionably one of the most important articles of the materia medica, whether we consider it in relation to its purgative virtues, or to its more extensive and specific influence upon the animal economy. Under the head of mercury, I shall consider the remediate powers of this article, so far as they depend on its constitutional or specific effects, and confine myself, in this place, merely to a consideration of its virtues as a purgative.

Given in proper doses, either by itself or in combination with other articles of this class, it produces copious evacuations, without any harsh or drastic effects. Along with its cathartic virtue, calomel has the peculiar power of exciting the biliary organs, and it is, therefore, particularly adapted as a purgative to all diseases attended with functional derangement of the hepatic system. A

* Dr. A. Duncan.

combination of calomel and jalap forms one of our most useful and common purgatives in bilious dieases, as well as for the ordinary purposes to which remedies of this kind are usually applied. Where we wish to procure easy, but copious alvine evacuations, we in general find our intentions fully answered by giving three or four grains of calomel in the evening, and exhibiting on the following morning an ordinary dose of any of the milder cathartics.

Calomel, from its possessing very little taste, is well suited as a cathartic for children. In my own practice I seldom employ any other purgative in the diseases of children. It evacuates more freely, and at the same time more mildly, than perhaps any other article of this class, the intestinal mucus which is often morbidly accumulated in the bowels of children. Of late it has been much recommended as a cathartic in dysentery. Dr. James Johnson speaks strongly in favour of large and frequently repeated doses of calomel in this disease, *as it occurs in tropical climates.* He gave *scruple* doses three or four times a day, and he affirms that it was generally followed by great alleviation of all the distressing symptoms which attend this complaint. The biliary organs are almost always prominently disordered in dysentery; and, independent, therefore, of its laxative operation, *calomel*, from its tendency to influence the liver, is, doubtless, a remedy of peculiar value in the treatment of this malady. Its usefulness in this respect is, indeed, now almost universally acknowledged; and there are not many physicians, in this country at least, who would neglect the aid which it is capable of affording.

When calomel is given in very minute doses, it has a direct anticathartic effect, by lessening the morbid

irritability of the intestinal canal. It is, indeed, one of our most valuable remedies for excessive purging. Dr. Ayre, of Hull, in his very valuable work on bilious affections, adduces satisfactory testimony of the utility of small doses of this remedy in cholera, diarrhœa, &c. From an eighth to one-fourth of a grain, given every half hour or hour, very often puts a speedy stop to the most violent vomiting and purging. I have employed it in this way with much advantage in cholera infantum, and especially in chronic diarrhœa, in which latter affection I regard it as decidedly the most important remedy we possess. In affections of this kind it is, perhaps, most effectually administered in union with prepared chalk; or, as I have sometimes given it, with small doses of some astringent vegetable powder, as, for instance, the powdered root of geranium maculatum. It may also be beneficially given, in union with minute portions of *ipecacuanha*, in diseases of this character. Half a grain of calomel, with a grain of ipecacuanha, given every three or four hours, often produces excellent effects in bilious diarrhœa.

Calomel is also frequently employed as a vermifuge; but as I shall have occasion to mention it again in relation to its powers in this way, in the chapter on Anthelmintics, I shall dispense with any further remarks on it in this place.

The usual dose of calomel as a cathartic, is from eight to twenty grains; ten grains may be considered as a medium dose. If given in too large a dose, it is apt to excite vomiting.

SECONDARY PURGATIVES.

HELLEBORUS NIGER.—BLACK HELLEBORE.

This article will be particularly described under the head of Emmenagogues, and I shall, therefore, in this place, speak of it only as a cathartic.

Of all the articles of the materia medica, this has held the greatest reputation among the ancients for its remedial powers, and especially for its virtues as a cathartic. It was particularly esteemed in the treatment of mania, melancholia, and gout. For the cure of this latter disease, it is mentioned by Aretæus as being superior to every other remedy then known.

Black hellebore is an exceedingly active cathartic, and, when given in an over-dose, is apt to produce the most alarming effects. It occasions very copious watery evacuations, and hence it has been a good deal employed in dropsical affections. Dr. Ferriar reports several cases of this kind, in which the good effects of this remedy were conspicuously evinced. He prescribed it in the form of Bacher's tonic pills; a preparation which, on various accounts, deserves much more attention than it appears to receive at the present day. Dr. Ferriar observes that when these pills have succeeded in his practice, their operation was, in general, soon manifested, producing, very early, copious evacuations. Their action, he says, is easy, but in protracted cases, contrary to Mr. Bacher's assertion, they evidently weaken the patient, however cautiously given.* From two to six of these pills may be given three times every day, according to the effects they produce.

* Medical Histories, vol. i. p. 46.

The black hellebore is now but seldom if ever employed by itself, or in substance, with a view to its cathartic effects. From twenty to thirty grains of the powdered root are said to be a proper dose for this purpose.

Formulæ.

Bacher's pills. ℞.—Extract. hellebor. nigr.
Extract. myrrh. aquos. āā ʒi.
Pulv. card. bened. ʒii.—M. In pilulas divid. āā gr. i. pondere. Dose, five pills, three times daily.

℞.—Extract. hellebor. ʒi.
Flor. sulph. ʒii.—M. Divide into two grain pills. J. Frank speaks highly of this combination in chronic scabby affections about the head.

CASSIA MARILANDICA.

This species of cassia is exceedingly abundant in many parts of the United States. Its leaves differ but little in appearance and properties from the senna of the shops. The predominant constituents of the leaves of this plant are resin and a volatile substance. "The tincture is of a dark-brown colour, and is rendered extremely turbid by water"* I have very frequently employed it instead of the officinal senna; and have always found it a certain and safe purgative. It seems, however, to be more apt to gripe than the common senna, "a quality which may, in a great measure, be corrected, by infusing with the leaves a small quantity of the root of glycyrrhiza, or anise, and employing a large quantity of water." The cassia marilandica is not so powerful as the senna of the shops. It requires about one-third more than the latter to produce an ordinary cathartic effect. For a particular description,

* Bigelow's American Medical Botany, vol. ii. p. 168.

and very accurate figures of this plant, the reader is referred to Dr. Barton's Vegetable Materia Medica of the United States, vol. i., and to Dr. Bigelow's American Medical Botany, vol. ii.

PODOPHYLLUM PELTATUM.—MAY APPLE.

This is a very common plant in the United States; and every where well known on account of its esculent, and, to some, delicious yellow fruit. Its root possesses valuable cathartic properties; but the *turiones*, or young shoots of this plant are said to be poisonous. Dr. Barton, the present professor of botany in the University of Pennsylvania, has shown me a letter from the Rev. F. Heckewelder, of Bethlehem, in which it is stated that the Indians of this country have been known to use these shoots as a poison, to destroy themselves. According to Dr. Bigelow, the root contains a resin, a bitter extract, fæcula, and a small proportion of gum. As a cathartic, the powdered root is pretty extensively employed in some parts of this country. I have myself given it very frequently instead of jalap, and have always found it active and safe in its operation. It is, however, more drastic and apt to gripe than jalap, nor does it appear to be so prompt in its effects as this cathartic. "Its operation," says Dr. Burzon, "in all cases in which I have administered it, is slower than that of jalap, but it leaves the bowels longer in a lax and soluble condition. I once took twenty grains at four o'clock, P. M., which gave me no disturbance till next morning, when its operation commenced, and produced continual motions all that day and part of the next night, together with severe tormina; this was the

first dose of podophyllum I had ever administered; and its effects being so decided, I have since prescribed it in a multitude of cases, and, for the most part, with similar results. It is more disagreeable to the stomach than common purgatives, and will often occasion emesis."*

Calomel renders its operation milder. In combination with cream of tartar it forms a good cathartic for the cure of anasarca and ascites. It has also been particularly recommended in bilious fevers. It certainly is entitled to considerable attention from the American practitioner, as a useful indigenous cathartic. "The medical properties of the podophyllum peltatum," says Dr. Bigelow, "are those of a sure and active cathartic, in which character it deserves a high rank among our indigenous productions. We have hardly any native plant which answers better the common purpose of jalap, aloes, and rhubarb."

The best time for taking up the root is in autumn, when the leaves are turning yellow. The extract of it is said to operate mildly and freely. For excellent figures of this plant, see Bigelow's American Medical Botany, vol. ii. and Barton's Vegetable Materia Medica of the United States, vol. i.

JUGLANS CATHARTICA.—WHITE WALNUT.—BUTTERNUT.

The white walnut grows in considerable abundance throughout the United States, and furnishes us with the most important of our indigenous cathartics. During the American revolution it was much employed in our

* American Medical Recorder, vol. iii. p. 332.

military hospitals, and was esteemed as a most excellent substitute for the ordinary officinal cathartics.

The extract made from the inner bark of this tree is alone employed for medicinal purposes. Given in doses of from fifteen to thirty grains, it operates as an active cathartic, without "occasioning heat or irritation." It is thought to be particularly applicable as an aperient in habitual costiveness, as it is less apt, than most other cathartics, to leave the bowels in a state of languor or costiveness. Calomel increases its activity, and combined with this article, it is said to be especially useful in bilious fevers. The bark of the root will blister the skin. The extract should be made from the bark in the month of May or June.

CORTEX SAMBUCI INTERIOR.

The inner bark of the common elder possesses very active purgative powers. Formerly, it was much used as a hydragogue in dropsy; and Sydenham, Boerhaave, and particularly Dr. Hoffmann, speak very highly of its usefulness in this disease. Some sixteen years ago, I employed it in several instances of dropsy, with evident advantage. In conjunction with its cathartic properties, it possesses considerable diuretic powers, and in full doses it is apt to excite pretty active vomiting. From four to six drachms of the dried bark may be infused in eight ounces of water, and taken in table-spoonful doses every half hour until it operates. Its operation is rendered much milder by uniting it with anise or fennel seed. Richter thinks that this article is undeservedly neglected as a remedy in dropsy; and my own observations incline me to the same opinion.

CHAPTER IV.

H. MEDICINES CALCULATED TO DESTROY OR COUNTERACT THE INFLUENCE OF MORBIFIC SUBSTANCES LODGED IN THE ALIMENTARY CANAL.

Anthelmintics.

ANTHELMINTICS are such medicines as have the power of destroying or dislodging and expelling worms from the intestinal canal. The operation of these remedies is not difficult to understand. Some of them act in the manner of a poison on these animals; others destroy them by a mechanical action on them; others again simply expel them from the bowels, by producing strong purging; and some finally increase the tone of the digestive organs, and thereby obviate that condition of the stomach and bowels which appears to favour the generation and nourishment of these animals.

There are five species of worms generated in the intestinal canal. The tænia solium; the tænia lata; the tricocephalus or trichuris; the ascaris vermicularis, and the lumbricoides.

The *tænia*, or tape-worm, is a long tape-like worm, "formed of a chain of flat articulations, united together by means of a border or edge varying in breadth or thickness." These links or articulations are possessed

of independent vitality, and capable of becoming distinct worms, when left in the intestinal canal.

The tænia occasionally grows to an amazing length. Brera speaks of one, preserved in the cabinet of the University of Pavia, which exceeds two hundred and thirty feet. There are two species of tænia: the tænia cucurbitina, or *armed* tape-worm, and the tænia lata, or unarmed tape-worm. The former of these species is found exclusively in the human subject. It is very difficult to dislodge it from the bowels, in consequence of the power it has of insinuating itself into the mucous membrane of the intestines, by means of two small fangs or crotches with which its head is armed, and from which it derives its specific name. This species of tænia is rarely discharged entire; it usually comes away in small pieces, or in single joints, resembling the seeds of the gourd. The tænia lata is not furnished with the fangs which characterize the other species, and is, therefore, much more easily expelled than the armed one.

The *trichocephalus* or *trichuris*, is but very seldom found in the human intestines. It was first described by Dr. Wagler, a German writer, about the middle of the last century, who found it in the cæcum of some French soldiers, who had died of a contagious epidemic at Gœttingen.* It is a very thin spiral worm, from an inch and a quarter to two inches in length. The external surface is marked by a great number of transverse lines, like rings. "One part of the body terminates in a filamentous elongation, as fine as a hair, and coiled round in a very surprising manner; the other part, turning in a spiral form, most commonly terminates in a hook, broad and obtuse, and similar to the pistil of the lilia-

* Brera's Treatise on Verminous Diseases, p. 44.

ceous flowers. From this extremity the worm can put forth a sort of tube enveloped in a sheath." It is commonly found in the cæcum or ileum.

The *ascaris vermicularis* or ascarides, are an exceedingly common worm, and are often discharged in astonishing numbers. They are round, thread-like, very slender, and not more than from a quarter of an inch to an inch in length. They skip and move with very great vivacity, and when touched contract to nearly half their length. The ascarides reside in the large intestines, and are commonly most abundant in the rectum, just within the anus. They are also occasionally discharged from the stomach. Brera states that he found several masses of ascarides in the œsophagus of a woman who had died of a nervous fever. He states, too, that this worm is sometimes found in the vagina of women, giving rise to much vaginal irritation, and leucorrhœal discharges. "The ascarides live longer than any other in the human body. It can exist an almost incredible space of time. The nature of the aliment which supports this worm has been the subject of various opinion. But it has at length been observed that the mucous matter which lubricates the intestines and the vagina of women, is the substance for which it has the strongest predilection. Agreeably to this, it is not wonderful that we find the ascaris vermicularis in other parts of the body in which the mucous fluid abounds, as the bladder, stomach, œsophagus, &c."*

The *lumbricoides* bear a strong resemblance, in shape, to the common earth-worm, and they were, by Linnæus, regarded as belonging to the same species. This worm is white, sometimes of a flesh-colour, and commonly about the thickness of a goose-quill, and perfectly

* Brera's Treatise on Verminous Diseases, p. 50.

round. "The canal which passes through the abdomen of the worm is yellow and transparent," which some regard as a characteristic sign of this species. Its length is from four to twelve inches. Worms of this species are generally situated in the small intestines, but not unfrequently also in the stomach, and occasionally in the colon and rectum. "When they have once passed the valve of Bauhin," says Brera, "we may consider them as destroyed." They are generally soon evacuated after having passed into the lower intestines. Children are particularly subject to the lumbricoides; and they are often discharged, even by very young subjects, in great numbers. They are sometimes discharged collected together into round balls.

Worms are capable of producing great disturbances in the system. Not only do they aggravate ordinary diseases when they are present, but they also give rise to a great variety of very alarming and anomalous affections. The whole train of spasmodic and convulsive diseases may proceed from the irritation of worms in the alimentary canal. Chorea, epilepsy, catalepsy, tetanus, paralysis, mania, convulsions, as well as a variety of other nervous and convulsive affections, are not unfrequently the immediate effects of this cause. Besides these diseases, worms have also been known to produce pleuritic and rheumatic pains, dysentery, remitting fever, hydrocephalus, consumption, chronic and spasmodic cough, &c. &c. But I must refer the reader to the works on practice, and particularly to Brera's excellent treatise on verminous diseases, for a full account of the morbid effects of intestinal worms.

Although we have no unequivocal signs of the presence of intestinal worms, except their actual discharge either from the bowels or stomach; yet there are cer-

tain symptoms which enable us to pronounce, with tolerable assurance, on their presence in the alimentary canal. Among these symptoms, the following are the most common and striking; a pale, leaden-coloured, and occasionally flushed countenance; a bluish streak under the eyes; these are dull and heavy; the pupils are dilated, or very much contracted; the lower eyelids and upper lip tumefy, especially during the night while sleeping; frequent itching in the nostrils, which causes the patient to pick his nose; fœtid breath; disturbed sleep, during which the patient grinds his teeth, is apt to lie on his belly, to scream out and start up suddenly, as if frightened; tingling in the ears; giddiness; interrupted speech; palpitation of the heart; muscular debility and flaccidity; pulse frequent, corded, and often intermittent; a dry and spasmodic cough; irregular and depraved appetite, being sometimes entirely suppressed, and at others exceedingly voracious; abdomen swelled and hard; diarrhœa or costiveness; unnatural, slimy, and fœtid stools; pricking and tearing pains in the bowels; emaciation; convulsions; paralysis, &c.

The above symptoms may be considered as common to all the species of worms that have been mentioned. There are others, however, which are peculiar to some of these species separately, and which it will be proper to advert to in this place.

A pricking and rending pain in the umbilical region; colic, with a rumbling noise in the belly, may be considered as symptoms peculiar to the lumbricoides. This worm is capable of perforating the intestines with the sharp cutting point of its head; and its efforts to insinuate itself into the mucous coat of the intestines are supposed to cause the pains just mentioned.

The symptoms which are peculiar to the ascarides are: an irritation and intolerable itching and pricking pain in the extremity of the rectum. These worms are usually found in conglobated masses, and although near the extremity of the large intestines, they are exceedingly difficult to remove entirely from their place of lodgment. They sometimes produce inflammation of the rectum, with bloody stools and tenesmus. Swelling and pain of the anus are, also, occasionally, observed as the effects of ascarides.

The symptoms of tænia, besides those which have already been mentioned, as common to the intestinal worms, are: a sense of weight and pain in the abdomen, accompanied with a burning motion of something alive in the bowels. "Occasional prickings, or rather bitings, are felt in the region of the stomach, the abdomen swells at intervals, and then subsides almost by undulation; a sense of cold from time to time pervades the abdominal viscera. The appetite is usually uncommonly great: the complexion is livid, and the patient is frequently faint; the pupils are unusually dilated; vertigo confuses the head of the patient, and excites vomiting; the legs vacillate, and sometimes the whole body seems to be affected with convulsive trembling. Often small substances resembling the seeds of a lemon or gourd, are evacuated with the fæces of the patient, which are portions of the marginal papillæ of these worms." It is stated also, by authors, that persons affected with tænia are apt to become uneasy and ill whenever they hear music, particularly the music of an organ at church.*

* Brera's Treatise on Verminous Diseases, p. 147.

PARTICULAR ANTHELMINTICS.

SPIGELIA MARILANDICA.—PINK-ROOT.—CAROLINA PINK.

This plant is indigenous to the southern parts of the United States, where it is found in great abundance. It has a perennial root, consisting of numerous fibrous branches, of a yellowish colour when first dug out of the earth, but becoming black on being dried and long kept. The stalk is herbaceous, and grows to the height of from six inches to two feet. Spigelia possesses a sweetish, slightly bitter, and somewhat nauseous taste. According to M. Feneulle's analysis, the root contains a fixed and volatile oil, a small portion of a resin, a bitter substance, in which the vermifuge or active principle of the root is supposed to reside, a mucilaginous saccharine matter, albumen, gallic acid, malate of potassa, and lime, and woody fibre. The bitter active principle is a brown substance, of a bitter and very disagreeable or sickening taste, "like that of the purgative matter of leguminous plants. It appears to possess some narcotic powers; for, when taken internally in full doses, it gives rise to a feeling of intoxication, great fulness in the vessels of the head, ringing in the ears, and vertigo. Water extracts its active principles.*

The pink-root is esteemed as a very valuable vermifuge. Its anthelmintic properties, however, are almost entirely confined to the long round worm, possessing little or no powers in destroying or removing the other species of intestinal worms. It was first introduced into regular practice by Drs. Lining,† Garden, and

* Bigelow's Medical Botany, vol. i. p. 144.

† Essays and Observations on Physic and Literature, vol. iii. p. 151.

Chalmers, of South Carolina, and it is now more frequently prescribed in this country for the expulsion of the round worm than any other anthelmintic we possess. The whole plant possesses anthelmintic properties; the root, however, is by far the most powerful portion of it. Spigelia is much more active in its recent state than when old; by very long keeping it loses nearly all its active qualities.

Dr. Thompson* took large doses of this root, and found it to produce acceleration of the pulse, flushed face, drowsiness, and a sensation of stiffness of the eyelids. It is now ascertained beyond a doubt, that this root possesses narcotic powers, capable of producing unpleasant and even alarming symptoms, when taken in very large doses. I once had a little patient, in the commencement of my practice, to whom I administered this medicine in very large and frequent doses, and the effects were such as clearly demonstrated its narcotic powers. The child, a boy about six years old, after having taken three or four gills of a strong decoction of the root, was suddenly affected with complete mental derangement. The derangement was precisely of the kind sometimes produced by the seeds of stramonium. He was affected by alternate fits of laughing and crying, ran and skipt about the room incessantly, and distorted his countenance in a frightful manner. The pupils of his eyes were greatly dilated, and his talk was wild and incoherent. These symptoms went off in the course of about twenty-four hours, and left him quite as well as he had been before he took the pink-root. I have, however, since prescribed this medicine in a great number of instances, and have not, except in one case,

* An Inaugural Dissertation on the Spigelia Marilandica, by Hodge Thompson. Philadelphia, 1802.

seen any ill effects from it, and in this instance it only produced slight giddiness, with dimness of sight, and dilatation of the pupils.

The pink-root may be given either in powder or in decoction. The latter mode of using it is, however, the preferable one, as the medicine is much more rapidly and equably diffused through the intestinal canal when in a liquid form than when given in a powder. The powder is given to children in doses of from ten to twenty grains. A pint of the decoction made from an ounce of the root should be given in the course of four, five, or six hours. It is usual to combine senna with the pink-root in order to procure the expulsion of the worms as soon as they have been destroyed or weakened by this anthelmintic. It is better, however, to give the spigelia by itself, and to exhibit a strong mercurial purge immediately after the medicine is taken. Given in this way it will seldom fail to bring away worms, if there are any present. The pink-root possesses purgative properties; but these are both uncertain and feeble.

Formulæ.

℞.—Rad. spigeliæ ʒiii.
Pulv. sem. santonicæ ʒii.
Flor. sulph. ʒiv.
Ol. chenopodii anthelm. gtt. x.
Syrupi communis. q. s. ut fiat electuar. Take a teaspoonful three times daily.

℞.—Rad. spigeliæ ℥i.
Fol. sennæ ʒi.
Sem. santonic. ʒii.
Rad. valerian. ʒii.
Aq. bullient. ℥x. Simmer down to ℥vi. Give a table-spoonful every two hours to a child from two to five years old.

During the last few years I have employed the following compound decoction, with peculiar success, for the destruction and expulsion of lumbricoides.

R.—Rad. spigeliæ. ℥i.
Conferv. helminthocord. ℥iii.
Sem. fœnicul. ℥ii.—M. Boil from a pint of water down to half a pint, and let the whole be used in a day.

MELIA AZEDARACH.—THE PRIDE OF CHINA.

This beautiful and stately tree was originally brought from Japan, and is now naturalized to most of the countries of Europe, and to the southern parts of the United States.

It appears from the testimony of some of our southern physicians, that the fresh bark of the root of this tree possesses very active anthelmintic properties. Dr. L. Kollock, vice-president of the Georgia Medical Society, speaking of the vermifuge powers of this tree, says: "It is a vermifuge of efficacy. Its use is, in some measure, general among the planters, and with many supersedes the use of all others. I have given it with success where all others in common use have failed of relieving. But when given in the months of March and April, while the sap is mounting into the tree, it has sometimes been followed by stupor, dilatation of pupil, stertorous breathing, subsultus, &c. But these symptoms, like those sometimes produced by spigelia, pass off without any perceptible injury to the system. This article, like the spigelia, is also a useful febrifuge medicine, in those affections usually denominated verminous fevers, but where no worms are voided. The common form is that of decoction. A large handful, say about four ounces, of the bark of the fresh root, is boiled in a quart of water, till it acquires the colour of strong coffee, *i. e.* to about a pint, of which from half an ounce to an ounce may be given every two or three hours till it operates. Given in this manner its operation is powerful, sometimes producing both vo-

miting and purging." The late professor Barton had a very high opinion of the vermifuge powers of this tree. He considered it as the most active anthelmintic with which we are acquainted.* The berries have also been employed with success as an anthelmintic. Children are suffered to eat them, "without any particular regard to the dose," and it is stated by some, that they are quite as efficacious as the bark of the root. The pulp of the fruit made into an ointment with lard, has been employed with success in tinea capitis.†

CHENOPODIUM ANTHELMINTICUM.—JERUSALEM OAK.

This is a native of Buenos Ayres, and of different parts of the United States. It has been much praised for its anthelmintic power, and from no inconsiderable experience with it, I am fully satisfied that it is worthy of very considerable attention as a vermifuge. The leaves and stalks are bitter, and possess an aromatic acrimony. Every part of the plant is endued with active properties, but the seeds are decidedly the most powerful. The juice of the fresh leaves is occasionally employed in the dose of a table-spoonful two or three times a day, for children under five years old. Given in this way, however, it is exceedingly unpleasant, and very few children can be induced to take it. I have employed the juice in a few instances with much advantage. The best, and, indeed, usual form for giving this remedy, is the powdered seeds, made into an electuary, with syrup. From twenty to forty grains of

* Collections for an Essay towards a Materia Medica of the United States, P. ii. p. 53.

† Thatcher's Dispensatory, p. 283.

the seeds may be thus taken two or three times a day, by a child four or five years old. It is usually directed to be given early in the morning, before eating, and again in the evening, some hours after supper.

The seeds of the chenopodium contain an essential oil, which has been lately much recommended, in cases of worms. It is, indeed, an exceedingly active vermifuge; I have, in many instances, succeeded in expelling numbers of lumbricoides with it, after various other anthelmintics had repeatedly been tried in vain. A child two or three years old may take from three to eight drops twice a day, mixed with a good deal of sugar or mucilage. After it has been given for three or four days, some brisk purgative medicine should be administered. The oil, like the expressed juice, is very offensive, both to the taste and smell, and this forms a very great obstacle to its employment with children. Where it can be regularly given, however, it is unquestionably one of the best anthelmintics of which we have any knowledge.

The Chenopodium Ambrosioides, another American species of this genus, bears considerable resemblance to the preceding species, and is not unfrequently mistaken for it. It may be known from the C. anthelminticum by its racemes being furnished with a number of small leaves crowded along the common peduncle. It possesses considerable anthelmintic properties, but is inferior, in this respect, to the C. anthelminticum. I have, nevertheless, employed it in a few instances with manifest vermifuge effects.

Formulæ.

℞.—Ol. chenopod. ʒi.
Sacch. alb.
G. arab. āā ʒi.—M. dein adde. aq. menth. sativ. ℥iii. Dose, a tea-spoonful four or five times daily, for three days in succession; after which a full dose of castor oil is to be administered.

℞.—Sem. chenopod. anthelm.
Rad. spigeliæ. āā ℥ss.
Fol. sennæ. ℥i.
Sem. fœnicul. ℥ii.—M. Boil from a pint of water, down to half a pint. Let the child take a table-spoonful, every hour or two, until the whole is taken.

GEOFFRÆA INERMIS.—CABBAGE-TREE.

The bark of this tree, a native of Jamaica and other West India islands, has been lately introduced into notice as a vermifuge of great powers. It is of a gray colour externally, and of a dark-brown or black and furrowed appearance on the inside. It has a sweetish and mucilaginous taste, and a pretty strong unpleasant smell.

This article is prescribed either in the form of powder, or decoction, or of extract. The decoction is, however, most commonly employed. It is made by boiling one ounce of the bark in a quart of water, till it acquires the colour of Madeira wine. Brera states, that it is more efficacious when it is combined with valerian. He says that he has employed it with great efficacy against lumbricoides and ascarides.

When given in full doses, it often produces nausea, and occasional vomiting. If the dose is too large, its effects are sometimes very violent, producing strong vomiting and purging, delirium and fever. It should, therefore, always be commenced with in small doses; and when carefully administered, it is said, by those who have tried it, to be a very powerful vermifuge. It is more particularly useful for the expulsion of the lumbricoides. Of the decoction two table-spoonfuls may be given to an adult two or three times a day; the powdered bark is given in doses of about half a drachm; of the extract from three to four grains are considered a

full dose. It is said by some, that cold water, drank during the employment of this remedy, is apt to occasion very alarming effects. When fever, delirium, or other disagreeable effects arise from its use, relief may be obtained by drinking warm water, vinegar, or castor oil.

DOLICHOS PRURIENS.—COWHAGE.

This plant grows in considerable abundance in the East and West Indies. It bears pods, thickly beset on the outside with stiff hairs, which, when applied to the skin, occasion a most intolerable itching. These hairs, by their mechanical action on worms, penetrating them like little spears, become a safe and effectual anthelmintic. It appears that this article is equally useful against every species of intestinal worm. When used for the expulsion of the tape-worm, it ought, however, to be given in at least double the quantity which is usually directed in cases of lumbricoides. In cases of ascarides, I have, in some instances, employed this article with much benefit. Against whatever species of worm it be employed, however, it should always be preceded by one or two cathartics, as its efficacy is commonly much increased by this practice, probably by exposing the worms more to the action of this substance. The proper mode of giving the cowhage is to mix it with molasses or syrup, into a thick electuary. Of this a tea-spoonful may be given to a child two or three years old, and repeated in the morning and evening for three or four successive days. The dose for an adult is a table-spoonful of the electuary. It appears to be quite a safe remedy, and I am persuaded, from my own experience, that it is often very effectual. Mr. Chamberlain says, that one of his children, about five years

old, "took, by stealth, three or four ounces of the syrup of cowhage, without any other inconvenience than a diarrhœa, which did her more good than harm."*

The root of this plant is said to possess very valuable diuretic properties; and a vinous infusion of the pods (12 to a quart) is stated to be a certain remedy for dropsy†. Dr. Collier, of London, in a late number of the London Medical and Physical Journal, proposes scattering some of the pubes dolichi prurientis over the body, for the purpose of rousing the system in cases of poisoning by narcotics. The effects are said to be sudden and powerful.

Formula.

℞.—Spicular dolichi. ʒiss.
Mellis. q. s. ut fiat electuar. Dose, a tea-spoonful for a child from two to five years old, taken twice daily, on an empty stomach, for three days in succession, and followed by a full dose of castor oil.

ARTEMISIA SANTONICA.

The seeds of this plant are an excellent anthelmintic. They have a bitter and subacrid taste, and a moderately strong and disagreeable odour. They contain a large portion of an essential oil, upon which their activity appears entirely to depend.

They are prescribed in substance, in infusion, in the form of an electuary, and in that of an extract. The dose for children under five years is from six to ten grains, and for adults from two scruples to a drachm, two or three times a day. The following is an excellent formula for giving these seeds: "Take an ounce of pulverized semina santonicum, and of black sulphur of mercury, resin of jalap, and of powdered cinnamon

* Thatcher's Dispensatory.
† Coffin's translation of Brera's work on Verminous Diseases.

bark, three scruples, white sugar seven ounces; dissolve these in water and boil to a consistence; mix the whole, and form the mass into boluses. The dose for a child is from one to two drachms."

Formulæ.

℞.—Pulv. sem. santonic. ʒii.
Pulv. jalapæ ʒss.
Calomel gr. v.—M. Divide into ten equal parts. Take one every three hours—(For children between two and five years old.)

℞.—Sem. santon. gr. xx.
Rad. rhæi gr. xii.
Aloes gr. vi.
Calomel gr. iii.
Rad. ipecac. gr. i.—M. Divide into three equal parts. One to be taken on an empty stomach in the morning.

℞.—Pulv. sem. santonic. ʒss.
Pulv. rad. valer. ʒii.
Pulv. rad. jalap. ʒss.
Sulph. potassæ ʒii.
Oxymel. scillæ q. s. ut. ft. electuar. A tea-spoonful is to be taken three times daily. This is Bremser's celebrated *anthelmintic electuary.*

POLYPODIUM FILIX MAS.—MALE FERN.

The root of this fern has been long celebrated as an efficacious anthelmintic. Pliny,* Theophrastus, and Galen,† prescribed it against tæniæ and lumbricoides; and it is still considered by many practitioners as a remedy of very important vermifuge powers. Its employment is, however, at present almost exclusively confined to cases of tænia; and there is much testimony extant of its efficacy against this species of worm. The powder of this root forms the basis of the celebrated specific of Madame Nouffer.‡

* De Simplici Medicina, lib. viii.

† Opera, lib. xxviii.

‡ The secret of this remedy was purchased by Louis XV. of France. The following are the directions given for using it:—Take three drachms

When administered in substance, it is given in doses of from one to three drachms, followed by a full dose of some active cathartic. In this way I have employed it in four or five instances, but never with any advantage. I have, however, known it to be used with perfect success in the practice of other physicians. The French commissioners who were appointed to examine the remedy of Madame Nouffer, assert that it will not destroy the armed tænia. Brera and others, however, contradict this statement. "I have had several patients attacked by armed tænia," says Brera, "who were happily cured by this remedy." He states, in a note, that he cured seven patients affected with armed tænia by Nouffer's method. Herenschwand, a German physician, had employed the male fern before Madame Nouffer's secret was known, in a way very similar to her method. His mode of using this remedy, is to administer two drachms of the male fern-root two successive mornings and evenings, and on the third day a cathartic composed of "twelve grains of gamboge, thirty of carbonate of potass, and two grains of turpentine soap, dissolved together in a cup of water." Three hours after, an ounce of ol. ricini is to be given, and repeated in an hour; if the worm does not come away, another dose of the castor oil must be given in two hours after. "But, if the worm be still not discharged, a clyster of equal parts of milk and water, and three ounces of oleum ricini must be injected towards evening,

of the root of the filix mas, reduced to a powder, mixed with four or six ounces of water. The whole is to be taken by the patient, in the morning, on an empty stomach. For children the dose is lessened to one drachm of the powder. If this produces nausea, the patient must inhale the odour of strong vinegar. Two hours after the powder is taken, the patient is to take the following bolus: take submuriate of mercury, dry resin of scammony, of each twelve grains, and five grains of gamboge; let them be finely powdered and formed into a bolus, and taken at one dose.

by which means the worm will come away entire and with ease." This plan of treatment has been found very efficacious by some physicians.

PUNICA GRANATORUM.

The bark of the pomegranate tree was a favourite anthelmintic with the ancient Roman physicians. Celsus prescribed it for the expulsion of tænia, and evidently placed much confidence in its powers. "Si lati sunt vermes," he says, "aqua potui dari debet, in qua lupinum, aut cortex mori decoctus sit; aut cui adjectum sit contritum vel hyssopum vel piperis acetabulum, scammoniæ paulum. Vel etiam pridie, cum multum alium ederit, vomat. *Postero que die mali punici tenues radiculas colligat, quantum manu comprehendet, easque contusas in aquas tribus sextariis decoquet, donec tertia pars supersit; huic adjiciat nitri paulum et jejunus bibat.* Interpositis deinde tribus horis, duas potiones sumat talis aquæ vel muriæ duas huic adjectæ; tum desideat, subjecta calida aqua in pelve." Aretius also recommends the use of this bark as a very efficacious remedy for the removal of tænia.

It is remarkable that so valuable a remedy as this appears to be, should so long have been wholly neglected, or rather unknown by the profession. About twenty years ago, Dr. Fleming, in his Catalogue of Indian Medicinal Plants, mentioned this article as a powerful vermifuge. Dr. Pollock afterwards published a case of tænia in an infant, in which this article was employed with complete success.* Quite recently, the favourable accounts which had been published of this remedy in tænia, have been amply confirmed by P.

* Medico-Chirurgical Transactions, vol. xi.

Breton, Esq. surgeon to the Rhamgur battalion in the East Indies. He relates eight cases which were promptly and completely relieved by this medicine. In almost every instance the tænia was expelled, entire and alive, in the course of from three to six hours after first taking the remedy. He employed it both in the form of decoction and of powder. The former he made by boiling two ounces of the bark in a pint and a half of water down to three-fourths of a pint. Of this he gave a wine-glassful every half hour, until four or five doses were taken. Of the powdered bark he gave twenty grains every hour, four or five times repeated. The remedy is apt to occasion nausea, and occasionally, also, when taken in strong doses, giddiness and faintness. When these effects ensue, the use of the medicine should be suspended for a time. "The temporary suspension and renewal of the medicine," says Mr. Breton, "may be successfully adopted under such circumstances."* Dr. Ruggia, a Neapolitan physician, has employed this remedy with great success; and Dr. Mile informs us that in a number of instances he has succeeded completely in removing tænia with this article. Dr. Mease, of this city, prescribed it in a case with the happiest effect; and I have heard of other instances of its successful employment in this country. Since the last edition of this work was published, I have prescribed this root in a case of tænia, with a highly satisfactory result. A worm of about eight feet in length was brought away in two pieces, and the patient has ever since been entirely free from his former distressing sensations.

* Edinburgh Med. and Surg. Journ. vol. x. p. 419.

CAMPHORA.—CAMPHOR.

Camphor has been a good deal prescribed as an anthelmintic. Brera and others extol it very highly. "Of all the remedies for the expulsion of the lumbricoides," says Brera, "there is no one, according to my observations, which is more active or more certain than camphor. This substance, administered according to rule, expels lumbricoides with facility and promptitude, and at the same time strengthens the intestinal tube and the whole body."* Pringle states that he found this remedy very efficacious in verminous diseases; and Moscate, as we are informed by Brera, generally preferred camphor to other anthelmintics in cases of lumbricoides. "The employment of camphor," says Brera, "is also attended with this precious advantage, that it counteracts the predisposition to the further development of verminous seeds. I have always used it with great success, and I cannot too strongly recommend its use to physicians in worm complaints."† Camphor has also been used with success against tænia. Vogel expelled one of these worms of great length by administering camphor in the form of pills and in enemata.

Camphor is most conveniently given in the form of an emulsion with gum arabic and sugar. By triturating camphor with carbonate of magnesia, we greatly increase its solubility in water. Two or three grains may be thus dissolved in an ounce of water, and if sugar be added to this solution, it forms an elegant and efficacious medicine in the worm affections of children.

* Treatise on Verminous Diseases, p. 299.

† Ibid. 199.

It is sometimes given in combination with assafœtida, semen santonica, valerian, &c.

The dose of camphor varies from one grain to thirty, according to the age and strength of the patient.

OLEUM TEREBINTHINÆ.

A GREAT deal has lately been said concerning the vermifuge powers of the spirits of turpentine. Its efficacy in the expulsion of tænia has been so frequently attested, that we can no longer doubt of its excellence in this respect.

On the continent of Europe, the spirit of turpentine has been for many years prescribed in verminous affections. In England and in this country, however, its introduction into practice as a vermifuge, is of recent date. It was first noticed in England as a remedy against tænia, in a letter from Dr. John R. Fenwick, of Durham, to Dr. M. Bailie, and published in the Medico-Chirurgical Transactions for 1811. Three cases are mentioned by Dr. Fenwick, in which the turpentine was successfully administered. Many other cases have since been related in the periodical journals, which demonstrate the powers of this remedy against tænia. When employed for the expulsion of this worm it should be given in large doses. From one to three ounces are commonly administered at once. Before the turpentine is taken, the bowels should be freely evacuated by some active purgative medicine. "Whatever quantity it may be thought proper to give at one trial of the remedy should usually be given in one dose. Three ounces of the spirit of turpentine taken at once will be more likely to destroy the worm or worms, than the same quantity taken one-third at once, repeated after an interval of

one, two, or three hours, and will be much less tedious to the patient."* When given in large doses, it generally passes through the bowels in a short time, and is, consequently, less apt to be absorbed, and to affect the urinary organs, than when employed in small doses. If it does not move the bowels three hours after it is taken, a large dose of castor oil should be given. Dr. Coffin says, that as soon as it begins to be discharged per anum, "whether the worm appear or not, the patient should be permitted to drink freely of any bland suitable liquid." The turpentine is also an active remedy against the lumbricoides. When employed for the destruction of these worms, however, it may be given in much smaller doses than is necessary for the expulsion of tænia.

Dr. Klapp, of this city, in a paper on worms in the stomach, adduces a number of examples of the value of this remedy as a vermifuge. He gave it in doses of from twelve to fifteen drops every four, five, or six hours, occasionally interposing a mercurial cathartic.† It acts with peculiar advantage when the worms are situated in the stomach. In several instances of verminous affections, attended with a dull pain in the epigastric region, sickness of the stomach after eating, vertigo, a dry short cough, foul breath, and an occasional choking sensation in the throat, I have administered turpentine in doses of from fifteen to twenty drops, continued for three or four days, and with complete success. The worms, under the use of this remedy, are usually discharged in a dissolved state. Under the head of stimulants, I shall again have occasion to speak of this article.

* Coffin's Translation of Brera's Treatise on Verminous Diseases, p. 250.

† American Medical Recorder, vol. iii. p. 155.

Many other vegetable substances have been recommended for their vermifuge powers. Of these the following are the principal: allium cepa, angelica, assafœtida, juglans regia, tanacetum vulgare, valeriana officinalis, veratrum sabadilla, caria papaya.

According to Schmucker, the veratrum sabadilla is a very powerful vermifuge; it is, however, apt to produce violent symptoms, particularly severe vomiting, and ought, therefore, to be employed with great caution. Garlic also possesses strong anthelmintic properties. Taken on an empty stomach in the morning, in the form of decoction, it seldom fails to expel lumbricoides, if any be present.

For the expulsion of ascarides, anthelmintics ought to be administered both by the mouth and in the form of injections. Clysters, are, indeed, indispensable, in cases of this kind. Aloes dissolved in water, and thrown into the rectum, is an excellent remedy against these worms. The infusion of semen santonica is also highly recommended for this purpose. Mr. C. M. Clark says, "a strong decoction of the sem. santon. is the most efficacious of all the injections in use."*

A very effectual mode of destroying these worms is to introduce a large bougie, or tent, into the rectum, smeared with mercurial ointment. Dr. Coffin says, that a friend of his who suffered violent irritation in the rectum from these worms, obtained complete relief by introducing a bougie covered with whale oil into the rectum.

I have, in several instances, succeeded in bringing away a large mass of ascarides, by injecting a solution of saccharum saturni, in the proportion of a drachm to eight ounces of water.

* Diseases of Females, p. 109.

STANNUM.—TIN.

Tin is a remedy of considerable powers as an anthelmintic. Of its efficacy against tænia, as well as against the lumbricoides, there is abundant evidence extant. Alston, a Scotch physician, was the first who prescribed it for the expulsion of tænia.* Dr. J. Fothergill also speaks in high terms of its powers against this worm. He recommends an ounce of the filings to be given for six days in succession, and a purgative to be taken on the seventh.† Brera observes, that in cases of old, large-armed tænia, he has known the methód of Nouffer to be ineffectual, and that in these instances the filings of tin, regularly administered, produced the desired effect with promptness. Tin appears to be most efficacious when given in the form of filings. These are given in doses of from half a scruple to an ounce, formed into an electuary with honey or syrup. They should be continued for several days, and occasionally suspended for the purpose of interposing a purgative. Brera says, that he has used this metal in the form of Guy's powder of Ethiopia, with great success.‡ He observes, also: "The aurum musivum is one of the

* Med. Essays and Observations, by a Society at Edinburgh, vol. v. p. 87.

† Medical Observations and Inquiries, vol. vi. p. 71.

‡ The following are the directions given for making this powder:—"Take seven ounces of pure rasped tin, an ounce of mercury, a drachm of sublimed sulphur, triturate the whole thoroughly in a mortar to a very fine powder. The dose is from twenty to thirty grains twice a day." Tin forms a principal part of the vermifuge of Mathieu. This man received the title of counsellor of the court, as well as a large pension for life, from the king of Prussia, for making known his method of expelling tænia from the bowels. This remedy consists of two electuaries; the first marked A, the second B.

"*The First Electuary*, A.—Take an ounce of very fine English tin filings, six drachms of the root of the polypodium filix mas, half an ounce of semen

most efficacious remedies employed against tænia, particularly the armed tænia. This preparation, more active than the powder of Guy, ought to be thus compounded:—Melt twelve ounces of very pure tin, and add to it three ounces of mercury; let the mixture cool, triturate it in a mortar to a very fine powder; while triturating the mixture, add seven ounces of sublimed sulphur and three ounces of muriate of ammonia. The dose is ten grains twice a day."*

HYDRARGYRUS.

Mercury possesses the power of destroying intestinal worms, and has been much employed by physicians for

santonica, a drachm of the resinous root of jalap, and of sulphate of potass, and of honey sufficient to make an electuary.

"*Second Electuary*, B.—Take two scruples of the pulverized resinous root of jalap, and of sulphate of potass, one scruple of scammony from Aleppo, ten grains of gamboge, and of honey sufficient to form an electuary.

"Those who may be inclined to adopt this method to expel tænia, must observe the four following rules:

"1. For some days previous the patient is to be confined to a suitable diet, that is, he is to eat salted substances,—for example, herrings, light porridges and broth, and leguminous articles.

"2. The treatment is begun by administering to the patient, every two hours, a tea-spoonful of the electuary, A. This course to be continued two or three days, till the worm is perceived to be in the intestines, and then,

"3. The patient is to take electuary B, and of this he also takes, every two hours, a tea-spoonful, till the worm is expelled.

"The discharge of the worm is facilitated by taking some spoonfuls of fresh oleum ricini, or by some clysters of the same oil.

"4. The age, sex, and temperament of the patient may require a considerable modification of the dose of these remedies; for this reason the treatment ought to be directed and modified by a well informed physician.

"Finally, it is to be borne in mind, that the virtue of the electuary A, depends in great part on the root of the polypodium filix mas; hence this root should be fresh, and its internal hard part only should be reduced to powder.

"This powder will have a reddish colour. *See Hartenkiel, Medicinisch-chirurgische Zeitung*, 1800, 2 *Band*, p. 293."

* Treatise on Verminous Diseases, p. 344.

this purpose. Formerly water boiled on mercury was recommended as a remedy against the lumbricoides. Many reports have been made in favour of its vermifuge powers when administered in this way; but as mercury seems to be entirely insoluble in water, the decoction is now entirely neglected as an inert remedy. Calomel, however, is certainly a very useful anthelmintic.* Given in minute and repeated doses, it seldom fails to destroy the lumbricoides. Were it not for its tendency to affect the mouth, it would be a very important vermifuge for children, as it may be more conveniently administered than any other medicine.

To children, from one-fourth to half a grain may be given night and morning, for three or four days, and a purgative given when the medicine is discontinued. The corrosive sublimate has also been prescribed as a vermifuge; but its extremely unpleasant taste renders

* Many of the nostrums advertised for the cure of worms, contain calomel as their principal ingredient, combined with scammony, jalap, gamboge, or some other purgative: they are uncertain and dangerous medicines; the method of exhibiting them in the form of lozenges, (*worm cakes*,) is also attended with inconvenience, for the sugar and the gum generating an acid, by being kept in damp places, may considerably increase the acrimony of the mercury; besides which, the calomel is frequently diffused very unequally through the mass, one lozenge may, therefore, contain a poisonous dose, whilst others may scarcely possess any active matter.

"*Ching's Worm Lozenges.*—These consist of *yellow* and *brown* lozenges, the former are taken in the evening, the latter the succeeding morning.

"*The Yellow Lozenges.*—Saffron ℥ss., water Oj; boil and strain; add of white panacea of mercury (calomel washed in spirit of wine) lb. i., white sugar xxxviii. lbs., mucilage of tragacanth as much as may be sufficient to make a mass, which roll out of an exact thickness, so that each lozenge may contain one grain of panacea.

"*The Brown Lozenges.*—Panacea, ℥vii., resin of jalap lb. iiiss., white sugar lb. ix., mucilage of tragacanth q. s., each lozenge should contain half a grain of panacea.

"*Story's Worm Cakes.*—Calomel and jalap made into cakes and coloured by cinnabar."—*Paris's Pharmacologia.*

it difficult to give to young patients. The ammoniacal muriate is said to be a very efficacious form for giving this remedy. The sulphate and sulphuret of mercury have also been recommended as useful against worms. The mercurial preparations are frequently given in combination with other vermifuges.

There are many other mineral substances recommended in the books, as possessing useful anthelmintic powers. The principal of these are, arsenic, sulphur, iron, muriate of barytes, muriate of ammonia, and muriate of soda.

SECONDARY ANTHELMINTICS.

SEM. SABADILLÆ.

The seeds of the Veratrum Sabadilla are highly extolled by Schmucker for their vermifuge powers; and Thilenius declares that they are decidedly the most efficacious in this respect, of all the anthelmintic remedies we possess. Kausch, also, (Med. and Chirurg. Observat.), has published some observations illustrative of the excellent effects of these seeds in verminous cases. It should be observed, however, that they possess active *narcotic* properties, and when administered in over-doses, often excite very alarming affections, such as a burning pain in the œsophagus, nausea, vomiting, abdominal pains, painful diarrhœa, subsultus tendinum, and great prostration of strength. In enormous doses they excite vertigo, delirium, and even convulsions. Violent as their effects are when given in over-doses, they may, nevertheless, be safely employed when given in proper portions. Schmucker

gave half a drachm* of the powdered seeds mixed with the same quantity of sugar, in the morning; on the following morning the same dose was administered; and if, after the second dose, no worms were discharged, he continued its use by giving daily fifteen grains, both morning and evening, interposing an active purgative every fifth day. By this course of management we are assured he invariably succeeded in procuring relief in verminous affections.

The sabadilla seeds have also been strongly recommended as a remedy in chlorosis, melancholia, and epilepsy. A peculiar active principle has been obtained from these seeds, to which the name of *sabadillin* has been given. This substance ranks with the acrid poisons; and Pfaff (Mat. Med. vol. vii. p. 228), calls it "the white vegetable arsenic."

The plant from which these seeds are obtained is a native of Mexico and of the Antilles. As this drug is met with in commerce, it consists of a mixture of capsules, peduncles, and seed. They have no odour, but are of a peculiarly acrid, bitter, and nauseous taste, leaving a disagreeable dryness in the fauces and throat, which lasts often for several hours.

CONFERVA HELMINTHOCORDON.—WORM-MOSS.

This sea-weed grows along the coast of Corsica. It has a saline and somewhat acrid taste, with little or no odour when dry. It does not appear to be a single species of *Fucus*, but consists of a number of small sea-plants of the family of *Algea*. It is said that upwards of twenty distinct species of algea have been found in this drug, as it is met with in commerce. It has been

* This is the dose for adults.

long used in Corsica as an anthelmintic; and although but very seldom employed in this country or in Europe for this purpose, my own experience has furnished me with several very striking instances of its efficacy. I have found it particularly valuable in those tedious cases of diarrhœa and intestinal irregularity which are occasionally met with in children, from verminous irritation. In what is usually called marasmus, that is, mucous diarrhœa, with a hard and tumid abdomen, pale and sickly countenance, and emaciation of the extremities, I have known the most favourable effects to result from the use of this article. I have good reasons for believing that *Swaim's vermifuge nostrum* is prepared from this drug. The helminthocordon was, some years ago, (in 1822,) introduced to the notice of the profession by Mr. Farre, of London, (An Essay on the Effects of the Fucus Helminthocordon upon Cancer. Lond. 1822,) as a valuable remedy in cancerous and scrofulous affections. As it contains a small portion of *iodine*, it is not improbable that advantage may be derived from its use in scrofulous affections; but its efficacy in true cancer has not been confirmed. When given in *large doses*, this article acts on the bowels as a purgative; and it is said that after its daily use in such doses has been continued for ten or twelve days, copious stools of a black, viscid, tar-like substance are usually discharged from the bowels. To produce this effect the infusion must be of the strength of six drachms of the *conferva* to a pint of water, and given in wine-glassful doses every six hours. Used in this way, it is said to have been entirely efficacious in scirrhus mammæ, and other glandular indurations. For verminous affections and marasmus in children, I have generally employed the infusion just named, in tea-spoonful doses, every morning, noon, and evening. Its use should be continued for three or four weeks.

CHAPTER V.

Antacids.

Antacids are substances which obviate acidity in the alimentary canal. The action of these remedies is purely chemical, "as they merely combine with the acid present, and neutralize it."*

In a perfectly healthy state of the digestive organs, no acid is, perhaps, ever generated in the alimentary canal. As it, however, frequently happens even in the most temperate, that digestion is retarded or enfeebled, the aliment taken in is often subjected to chemical changes, producing acidity and flatulency. While these changes go on in a moderate degree, the system does not, in general, experience any particular inconvenience from them. When, however, the evolution of acid is great, or has become habitual, a train of various and distressing symptoms generally ensue.

Acid does not, however, always depend on a chemical change in the substances received into the stomach. It has, in fact, been well ascertained that this acid often differs radically from that which is formed by vegetable fermentation. It appears often to possess a peculiar character, depending, doubtless, on a morbid secretion in the stomach. Still, however, as the generation of acid in the primæ viæ is very frequently accompanied by the evolution of large quantities of air, it would

* Murray's Mat. Med.

appear to be pretty certain that fermentation does take place in the stomach and bowels, and that the acid often depends on this cause. "Acid," says Richter, "in the primæ viæ, is certainly of two kinds, arising from two different causes. It is sometimes plainly the consequence of a *corruptio spontanea*, of acids taken by the mouth, or of meat and drink which have become sour; and in this case it only incommodes the patient when he has taken such meat or drink; it is easily and constantly blunted by alkaline or absorbent medicines, and keeps away as long as the patient carefully uses *diæta antacida*. Medicines which strengthen the system, with an antacid diet, generally cure the patient of this acidity. But sometimes the patient is incessantly tormented with acid, eat what he will, even though he only takes animal food. None of the medicines which blunt acidity are of any service, or they only procure him a short mitigation. And in this case the acid is not the produce of a *corruptio spontanea*, but a *secretio perversa liquorum menstruorum*. The patient, as Kæmpf says, has a brewery of vinegar in his stomach."*

The secretion of uric acid by the kidneys, is much influenced by the presence or absence of acidity in the stomach. The habitual existence of acid in the primæ viæ is almost invariably attended with an abundant secretion of the uric acid; and hence we find alkaline remedies amongst the most useful means for counteracting the secretion of lithic acid by the kidneys.

The existence of acid in the stomach produces, in some, a very disagreeable itching in the skin. I have seen several persons who experienced a very troublesome itching in the skin whenever acid was formed in

* Medical and Surgical Observations, p. 190. See also the article Assafœtida, in this work.

the stomach, and who invariably obtained relief from a dose or two of magnesia.

The connexion between acidity in the stomach and gout, has often been observed. "Acid," says Dr. Scudamore, "when much accumulated in the primæ viæ, will always powerfully concur with the other causes to excite a fit, and will sometimes prove alone sufficient. I have met with several instances, in which the discharge of acrid fluid from the stomach has produced immediate and very sensible relief."*

In infants, acidity in the bowels is very often the cause of much uneasiness and distress. Whenever the stools are of a grass green colour, we may be assured of the existence of acid in the primæ viæ. The bile in its natural state is not green, but of a pale yellow colour. The green colour which we may often observe it to possess in the discharges of infants, depends on the action of the gastric acid upon it. The efficacy of the common practice of giving cretaceous powders, when the stools have this grass-green appearance, depends chiefly on their property of obviating acidity.

LAPIDES CALCARIÆ, ET TESTACEA.

Calcareous substances are among the most useful articles of this class of remedies. Of these there are a great number, the most important of which are the following:

Creta Præparata.—This is a very useful antacid, and much employed in diseases of children depending on acidity and relaxation of the alimentary canal. It is, indeed, particularly serviceable in the chronic bowel complaints of infants, whether acid be present or not.

* Scudamore on Gout, p. 57. Philad. edit.

The usual mode of prescribing it is in union with gum arabic, opium, cinnamon, catechu, &c.

Testæ Ostrearum.—Pulverized oyster-shells are an excellent antacid and absorbent. They are given with bitter or aromatic articles, in debility of the digestive organs, attended with sour eructations and other gastric affections arising from acidity. De Haen states, that he cured rachitis, by giving twice a day twenty grains of powdered oyster-shells. This article has also been recommended as very beneficial in the debility and dyspepsia which arise from excessive onanism.* It may be given in doses of from ten grains to two drachms.

Oculi Cancrorum.—These are small hemispherical calcareous bodies, found on each side of the stomach of the *cancer astacus*, during the month of August. They consist of carbonate of lime and animal gelatine. They are slowly soluble in vinegar. This article has been much used in affections arising from acidity of the first passages. It has been recommended as particularly serviceable in disorders of the urinary organs, depending on this cause. I presume, however, that it is not superior, in this respect, to any of the other calcareous articles of this class. Gaubius and others, recommended it as useful in leucorrhœa, especially when this complaint is accompanied with acid in the primæ viæ.† It has been stated by some German writers, to be apt to excite hæmorrhages, and we are, therefore, cautioned against employing it where there is much disposition to hæmorrhage. I have no idea, however, that there is any foundation for this opinion. This substance is given in doses of from twenty grains to a drachm.

The officinal calcareous preparations are: *mixtura*

* Burdach, Arzneimittellehre, vol. ii. p. 504.

† Shippers, über eine besondere würkung der krebsaugen beym weisen flusse—in Sammlg. auserl. Abh. xviii. B. I. 471.

cretæ, Lond. Ph.; *potio cretacea*, Edin. Ph.; *pulv. cretæ compositus*, Lond. Ph.; *Pulv. carbonatis calcis compositus*, Edin. Ph.; *Pulv. cretæ cum opio*, Lond. Ph.

Formulæ.

℞.—Extract. hyoscyam. gr. ss.
Lapid. cancror. gr. xx.—M. Divide into six equal parts. S. Give one every hour to a child of from two to five years old.

℞.—Pulv. cretæ compos. cum opio ℈i.
Pulv. catechu extract. gr. xv. This is a dose for an adult, and is an excellent remedy in recent diarrhœa.

℞.—Cretæ ppt. gr. xx.
Pulv. ferri. phosphat. gr. vi.
Pulv. rhæi gr. x.—M. Divide into ten equal parts. I have found this a peculiarly useful combination in the bowel complaints of infants. After the operation of a dose of rhubarb, one of these powders may be given every six hours, *provided no fever be present.*

℞.—Cretæ ppt. ʒiii.
Sacch. alb.
Pulv. g. arab. āā ʒiss.
Tinct. opii gtt. xl.
Tinct. kino ʒii.
Aq. menth. ℥vi.—M. S. Dose, a table-spoonful every two hours, in diarrhœa.

AQUA CALCIS.

Lime water is an efficacious corrective of acidity in the first passages. In dyspepsia, attended with acid eructations, and in chronic diarrhœa, this article is often of great service. It is usually given with milk, in doses of from two to four ounces, three or four times a day. Of the various remediate powers of this preparation, and especially of its utility in counteracting the lithic acid diathesis, I shall have occasion to speak when I come to treat of Antilithics.

MAGNESIA ALBA.

Magnesia unites readily with the acid generated in the stomach, and is especially serviceable in all cases of acidity, attended with a torpid state of the bowels. Where, however, diarrhœa and a very irritable state of the intestinal canal exist, it is much less useful than the calcareous antacids already mentioned, since it acquires pretty active purgative qualities when united with an acid. In the bowel complaints of infants, attended with green and griping stools, magnesia combined with rhubarb has long been a favourite remedy with practitioners.

CARBONAS POTASSÆ ET SODÆ.

The fixed alkaline salts are the most perfect neutralizers of acids. They have accordingly been much prescribed in affections attended with accumulations of acid in the stomach and bowels; as they are, however, much less pleasant and not more efficacious than magnesia, in the diseases which depend on this cause, a preference is generally given to this latter substance. In dysentery, attended with acid eructations, or other symptoms denoting acidity in the alimentary canal, the carbonate of potass has been particularly recommended by Causland and Rademayer. Dr. Mitchell, of New York, also speaks highly of the alkaline medicines in this disease. The dose of these carbonates is from five to twenty grains.

CHAPTER VI.

B. MEDICINES WHOSE ACTION IS PRINCIPALLY DIRECTED TO THE MUSCULAR SYSTEM.

I. *Medicines calculated to correct certain morbid conditions of the system, by acting on the tonicity of the muscular fibre.*

TONICS.

These are medicines which impart vigour and tone to the system, without materially increasing either the heat of the body or the frequency of the pulse.

Cullen thought that the tonic principle of remedies does not differ essentially from that which gives to them their bitter taste. That this opinion is without foundation, is at once evident from the fact, that some intensely bitter substances do not possess the least tonic virtue, whilst, on the other hand, some very valuable tonics are destitute of bitterness. Thus, opium and digitalis, though very bitter, have no tonic properties; and some of the metallic preparations are tonic, though devoid of bitterness.

The action of tonics, unless taken in very large doses, is not manifested by any immediate and obvious excitement. The vigour which they impart to the system is the result of a slow operation on the animal economy, and altogether different in its character from

that temporary augmentation of force which is the immediate consequence of the operation of stimulants, properly so called.

When tonic remedies are employed in a debilitated state of the system, their operation is evinced by a gradual and permanent increase of the force of the circulation; an invigoration of the digestive powers, and of the general energies of the animal economy.

There are three ways in which these remedies may produce tonic effects on the system. 1. They may increase the strength of the system by improving digestion, and thereby giving rise to a more abundant and healthy formation of chyle. That debility and disease may arise from an imperfect state of the chyle, there can be no doubt. Out of this fluid all the other fluid and solid parts of the system are ultimately formed; and, we may presume, that every material deviation from its healthy state must interfere with the regular operations of the animal economy. It is evident, therefore, that whatever has the power of restoring the digestive energies of the stomach, and thereby the healthy condition of the chyle, will, by this effect alone, give health and vigour to the body. 2. Tonics may also impart tone to the system by exciting a peculiar action in the part to which they are immediately applied, and thence propagating a similar action to the other parts of the body, through the medium of the nervous system. The effects of impressions on the stomach are often manifested in other parts of the body in an exceedingly violent and sudden manner. Debility, syncope, and even death, are sometimes suddenly produced by the action of indigestible food on a weak stomach. Seeing, therefore, such violent affections excited by articles that suddenly resist or prostrate the energies of the stomach, there is reason to

believe, on the other hand, that whatever has a tendency to give vigour to this organ, will communicate a corresponding vigour to the general system.* 3. Finally, tonics may strengthen by being absorbed into the circulation, and by thus acting directly on the whole organization, through the medium of the blood. That remediate substances are carried into the circulation, is a fact which is, I trust, evident by what has already been said on this head in the first chapter; and there can be no reason why a tonic substance absorbed into the circulation, should not produce the same invigorating impressions on the parts with which it comes in contact, while circulating in the blood, as when applied to the surface of the stomach, the rectum, or skin. That they do in fact operate in this way, is further rendered probable by the new qualities which some of these substances impart to the urine and the other excretions.

The remedial effects of tonics are, however, not to be exclusively referred to any one of these modes of influencing the animal economy. They, no doubt, generally act, at once, in all these ways.

Although tonics do not produce any very evident excitement in the system, yet they have an obvious tendency to increase the inflammatory diathesis, and they are, therefore, as a general rule, inadmissible whenever there is any tendency to inflammatory action in the system. It is, indeed, at once obvious, from the general effects of these remedies, that the diseases of debility alone are those in which they may be employed

* Qui stomachum regem totius corporis esse
Contendunt, vera niti ratione videntur.
Hujus enim validus firmat tenor omnia membra;—
At contra ejusdem franguntur cuncta dolore.
Serenus Samonicus, De Med. Precept.

with advantage or propriety. As a general axiom, this undoubtedly holds good; yet experience has demonstrated that tonics may sometimes be used beneficially, in cases attended with an evident phlogistic condition of the system, as in the declining stage of gout and rheumatism.

As I shall have occasion to speak fully of the therapeutic application of tonics, when treating of the particular articles of this class, I will not pursue this subject any further, but proceed at once to the consideration of the individual tonics.

CINCHONA.—PERUVIAN BARK.

The cinchona is unquestionably the most important tonic we possess, and justly ranks among the most useful and indispensable articles of the materia medica.

Its introduction into regular practice is said to have occurred in the following manner:—In 1640, the lady of the Count of Cinchon, viceroy of Peru, was affected with a tertian intermittent, which resisted every mode of treatment that her physicians could devise. Being at length nearly exhausted by the disease, she was advised by the governor of Loxa, who had been made acquainted with the febrifuge virtues of this bark by an Indian, to use it as a remedy for her disease. She took it, and her complaint soon disappeared. The event of this case spread the reputation of the remedy rapidly throughout Spain, whence it was carried into Italy by the Jesuits, where it was gratuitously distributed among the poor sick at Rome, by Cardinal de Lugo, and his physician Sebastian Baldo. This latter person has the credit of having written the first work on this valuable remedy.*

* Alibert.

Its fame now rapidly extended itself through France, Germany, England, &c. and although much opposed on all sides, the value of its powers was finally established on the testimony of almost universal experience. It was not, however, till the year 1737, that the botanical character of the tree which affords this bark was ascertained. La Condamine, while travelling through the province of Loxa in that year, had an opportunity of examining the tree, a full description of which he published on his return to France, in the Memoirs of the French Academy. The name of *cinchona officinalis* was, soon afterwards, given to this tree, by Linnæus, in commemoration of the incident mentioned above. The powdered bark was also known by the name of Jesuits' powder, in consequence of its first having been brought into Europe, and extensively employed, by the Jesuits.

The genus cinchona is a very extensive and remarkable family of trees of the natural order *Rubaceæ* and of the class Pentandria, order Monogynia, of Linnæus. They grow on mountains, and are never found in the plains. Until of late a great deal of confusion and uncertainty existed with regard to the natural history of this family of trees; and, indeed, there still exists no inconsiderable perplexity on the subject.

The different varieties of bark, as they occur in commerce, appear to be made up of a considerable number of distinct species, and are assorted into the *pale*, the *red*, and the *yellow*.

I. *The Pale Bark.*—The *pale* or gray bark of the shops is principally derived from the *cinchona condaminea* of Humboldt and Bonpland. This species of cinchona is found in abundance in the province of Loxa, and the neighbourhood of Guancabamba and Ayavaca, in Peru. Bonpland asserts that this is by far the most valuable species of bark, and from its acknowledged

superiority, the Spaniards have given it the name of *cascarilla fina.*

Besides this species, there are others which frequently go to make up the *pale* bark of commerce. Bonpland and Humboldt inform us that the *cinchona scrobiculata*, a species found very abundantly in the province of Jean de Bracemoras, forms a very great portion of the pale bark. The *cinchona nitida*, also, is occasionally mixed with *C. condaminea.*

In the United States, the pale barks are known under the general title of *Loxa bark*, and the finest specimens are sometimes called *crown bark of Loxa.* "The extension of the term Loxa bark to all the different varieties which belong to this class, is peculiar to the United States, and is not authorized by the facts of the case. They are not obtained exclusively from the province of Loxa, nor from the country bordering on it. The French and Germans distribute them into at least two distinct divisions, originally named from the place of growth or export, but depending at present upon peculiarity of properties, without any geographical reference. One of these divisions has the title of *Loxa bark;* the other is called *Lima bark*, by the French, and *Huanuco bark* by the Germans and Spaniards."

1. The genuine *Loxa bark* consists of very slender cylindrical pieces, from twelve to eighteen inches in length, varying in size from that of a small quill, to that of the little finger. The bark is not above a line in thickness, with a grayish coloured epidermis, somewhat rough, and marked with transverse fissures. The internal surface is even or smooth, of an orange yellow or reddish hue, which becomes brighter on being moistened. The fracture is not fibrous or granular, but even and somewhat shining. "Two sub-varieties exist in this division—one with a light gray epidermis,

called in French pharmacy *quinquina gris de Loxa;* the other brown, or dark gray externally, named *quinquina gris brusa de Loxa.*" The genuine, or best *Loxa* bark is obtained from the C. condaminea.

2. *Lima Bark.*—The finest specimens of this variety of pale bark, do not differ materially in appearance from those of the Loxa. The ordinary and coarser kinds, however, are much thicker; the external surface is rough, with a great number of very *closely* arranged fissures, the epidermis being, generally, thick and spongy, separating readily in small laminæ, and leaving the surface marked with numerous circular depressions. It breaks with fracture, "which is compact and close on the exterior, but woody and fibrous on the interior. The internal surface is yellowish or reddish, and rougher or more ligneous than that of the Loxa bark." This variety of cinchona is thought to be derived from the C. lancifolia, the C. hirsuta, and from the C. purpurea. The epidermis of Lima bark is sometimes nearly white, "from the presence of chalky cryptogamous plants," and pieces, occasionally occur, having a tawny ochreous appearance of the external surface. The former is called *Lima blanc* by the French, and the latter is the *Cascarilla ferruginea* of the Spaniards.

The pale bark appears to be much less extensively employed in this country at present, than formerly. It yields but little *quinia*, and is, therefore, rejected in the manufacture of the sulphate of quinia. It contains, however, *cinchonia* in large proportions, and as this principle is but very little, if in any degree inferior to quinia as a febrifuge, the *pale bark*, is, doubtless, among the most valuable varieties of cinchona.

II. *Yellow Bark.*—The officinal *yellow* bark, known in commerce under the name of *calisaya*, comes to us in pieces, of from three or four inches to a foot and a half

in length, not so much rolled up as the preceding variety, and from a quarter of an inch to two or three inches in diameter. The epidermis is of a yellowish-brown colour, somewhat variegated by gray-coloured or white lichens, marked by transverse fissures, and easily separated from the subjacent cortical structure. "In the larger kinds it is thick, rough, deeply indented by the transverse fissures, and composed of several layers, separated from each other by a reddish-brown membrane like velvet." This epidermis possesses neither taste nor any of the active properties of the bark, and when pulverized exhibits a dark red colour. The texture of the bark is fibrous, and the fracture presents a number of shining points, which, when examined with a microscope, are found, when freed from the salmon-coloured powder that surrounds them, to be yellow and transparent. They readily separate when the bark is powdered, in the form of spiculæ, which, like those of the cowhage, insinuate themselves into the skin, and produce a disagreeable itching and irritation. This variety of bark has a less astringent, but much more bitter and nauseous taste than the pale bark.

The *calisaya* sometimes occurs in flat, or nearly flat pieces, almost entirely divested of the epidermis, presenting, therefore, the yellow colour of the bark, both on the external and internal surface. The bark of these flat pieces is usually much thicker, and of a more loose and fibrous texture than in the quilled variety. It is also less bitter, and less active in its medicinal properties than the rolled or quilled calisaya.

The yellow bark, or calisaya, contains a larger proportion of quinia than any other variety of cinchona, but it yields very little cinchonia.

The salts of quinia and lime are so abundant in this variety of bark, that the infusion of it instantly precipitates a solution of the sulphate of soda.

The particular species of cinchona which furnishes the calisaya or more valuable variety of yellow bark, is still a subject of doubt. It has, by many authors, been referred to the *C. cordifolia;* but the fact that no *calisaya bark* is brought "from those regions where the C. cordifolia most abounds," renders this opinion extremely problematical. It is much more probable that it is derived from a variety of the C. lancifolia; for Mutis, whose testimony on this subject is entitled to great respect, asserts, "that it is positively derived from this species."

III. *Red Bark.*—Until recently, this variety of bark has been almost universally regarded as the product of the *C. magnifolia* of Ruiz, and *C. oblongifolia* of Mutis. The researches of Von Bergen, however, have rendered it manifest that this opinion is incorrect, and that nothing is, as yet, certainly known as to the particular species of cinchona from which the officinal red bark is derived. It is asserted by some that it is obtained from the same species which afford the pale barks, "but taken from larger branches, or from the trunk." La Condamine observes, that in the neighbourhood of Loxa, three kinds of bark are known, namely, a white, a yellow, and a red bark; all of which, he says, are the produce of trees growing together, and "not distinguishable by the eye."

The officinal red bark comes to us in pieces of various shapes and sizes. Some pieces are flat, others are partially rolled, and some are in quills or closely rolled cylinders. The rolled or quilled pieces vary in size, from about half an inch to two inches in diameter, and the flat pieces are generally large and thick, as if obtained from the trunk of the tree. The epidermis is reddish-brown or gray, with fissures running in various directions, somewhat rough, and marked in many in-

stances with a great number of small projecting points, "which correspond with small prominences on the exterior surface of the proper bark." The external cortical layer, immediately beneath the epidermis, is brittle, compact, and of a dark-red colour, breaking with a smooth and resinous fracture. The internal surface is redder, of a fibrous woody texture, possessing more bitterness and astringency than the external part. This variety of bark possesses both quinia and cinchonia in considerable quantities, and is generally regarded as the most valuable of all the officinal varieties of cinchona. Mutis, however, observes that its febrifuge powers are not equal to those of the yellow bark. It is very frequently found in an adulterated state, being either nothing but pale bark, coloured with some other substance, or the red bark mixed with other powders resembling it in colour, &c.

Carthagena Barks. The different varieties of cinchona brought from the Atlantic ports of Columbia are known in commerce under the name of *Carthagena bark.* All these barks have a white and micaceous epidermis; their taste "is less bitter, but more nauseous than that of the officinal varieties," and they contain but small portions of quinia and cinchonia. There are four varieties of Carthagena bark; the *yellow*, the *brown*, the *red*, and the *Santa Martha bark.* The yellow variety is said to be the product of the *C. cordifolia*, and comes to us in irregular fragments, covered with a white and glossy epidermis. It is from one to three lines in thickness, of a spongy texture, breaking with a rough and splintery fracture. The brown Carthagena bark is also covered with a white and smooth epidermis, and wholly without fissures. It is of a hard compact texture, very heavy and thick, and of a dark-brown colour internally. Its taste is bitter and astringent, and more

nauseous than that of any of the officinal barks. The red Carthagena bark "is distinguished from the officinal red bark by its white shining, almost micaceous epidermis. It is sometimes compact and bitter, sometimes spongy, and with little taste." It is thought to be the product of the C. oblongifolia. It is seldom met with in this country. The Santa Martha bark has been but recently introduced to the notice of the profession. It is generally in small, irregular fragments, very slightly curved, from one to three lines in thickness, generally divested of its epidermis, "and presenting an appearance as if chipped from the large branches or trunk of the tree." Among these flat pieces there are usually others which are rolled or quilled, covered here and there with patches of a white or gray epidermis. This bark is "compact, of a pale-yellowish colour, and a bitter and somewhat nauseous taste. It is usually considered superior to the ordinary Carthagena bark." It is probably derived from the *C. macrocarpa*, the *C. ovalifolia* of Mutis, a species which, according to Humboldt, grows abundantly in the neighbourhood of Santa Martha.*

Chemical character. There is, perhaps, no article in the materia medica which has been so frequently subjected to chemical analysis as the different varieties of the officinal cinchona. It would be useless as well as uninteresting to give a detailed account of the various analyses that have been made of the bark. It will be sufficient to state the results of the most recent and authentic researches on this subject.

Various opinions have been expressed in relation to the particular principle in which the tonic or active properties of the bark are supposed to reside. Sequin thought he had demonstrated the existence of gelatine

* See the Dispensatory of the United States of America, p. 220.

in cinchona, and he ascribed its febrifuge powers to this substance. In consequence of this supposed discovery, some of the French and Italian physicians employed glue in intermittents; and, according to the reports that have been published, with very considerable success. Mr. Westring, a Swedish physician of great eminence, was led to conclude from his observations and experiments, that the febrifuge power of bark resided wholly in the tannin which it contains.

More recent chemical researches, however, have demonstrated the existence of peculiar alkaline principles in cinchona, in which its febrifuge or tonic properties appear exclusively to reside. We are indebted to Pelletier and Caventou for the discovery of this substance in cinchona, (Annales de Chimie, &c., T. 15, p. 289. 337,) and its properties were subsequently more fully investigated by Bardollier, Henry, Pfaff, and Meissener, (Schweigger's neues Jour. d. Chemie. und Physick. B. 2, p. 413, B. 3, p. 62.)

There are two kinds or varieties of this alkaline principle in cinchona. To the one the name of *cinchonia* is given; and the other is termed *chinium*, or *quinia*, or *quinine*. Both these substances are but sparingly soluble in water; alcohol and ether, however, dissolve them readily. They unite readily with acids, and form neutral salts, soluble in alcohol and ether, but not in water, unless supersaturated with the acid. In the natural state, as they exist in the bark, these alkaline principles are united with the *kinic acid*. They are very bitter, and their bitterness is considerably increased by their union with acids.

Cinchonia, when pure, consists of fine white, transparent, needle-shaped crystals. It dissolves with great difficulty in water, much more readily in ether, and still more speedily in alcohol. In consequence of its diffi-

cult solubility, it seems to possess but little bitterness when first tasted; when retained in the mouth, however, until a portion of is dissolved in the saliva, or when its ethereal, alcoholic, or oleaginous solution is put upon the tongue, it tastes extremely bitter. It readily unites with, and neutralizes acids, forming with them saline compounds. "Of these salts of cinchonia, the sulphate, nitrate, muriate, phosphate, and acetate, may be dissolved in hot water and in alcohol. The tartrate, oxalate, and gallate are insoluble in cold water." Cinchona, according to an analysis made by Pelletier and Dumas, is composed of 76.97 parts of carbon, 9.02 of nitrogen, 6.22 of hydrogen, and 7.79 of oxygen. It does not suffer decomposition when exposed to the air, but it slowly absorbs carbonic acid, "and acquires the property of effervescing slightly with acids."

The sulphate of cinchonia is frequently employed as a febrifuge by the German and French physicians. It consists of a white and very bitter salt, "crystallizing in flexible, somewhat shining four-sided flatted prisms, terminated by an inclined face, and generally collected in fascicula." It dissolves in fifty four parts of water, at a medium temperature, and in less than thirty parts of boiling water. By adding more acid, it is converted into a bi-sulphate, which is readily dissolved by less than half its weight of water at 58°. According to Pelletier and Caventou, this salt consists of one hundred parts of cinchonia, and 13.021 of sulphuric acid.

Quinia.—This valuable constituent principle of the officinal barks, may, by nice management, be obtained in the form of pearly, silky, needle-shaped crystals; but, as it is usually prepared, and met with in the shops, it consists of a whitish and flocculent substance, resembling the oxyde of zinc. It is much more bitter than

cinchonia, and dissolves readily in alcohol and ether, but is almost insoluble in water. When subjected to heat, it fuses like the resins, and becomes brittle on cooling. It unites with acids and forms crystallizable salts. When exposed to the open air it undergoes no changes, nor does it absorb carbonic acid. According to Pelletier and Dumas, *quinia* is composed of 75.02 parts of carbon, 10,43 of oxygen, 6.66 of hydrogen, and 8.45 of nitrogen.

The sulphate of quinia is justly regarded as the most valuable of all the cinchonine preparations. When properly prepared, it consists of white, silky, needle-shaped crystals, "interlaced among each other, or grouped in small star-like tufts. It possesses an intensely bitter taste; it dissolves very sparingly in cold water, requiring about seven hundred and forty parts at fifty-four degrees of Fahrenheit, for solution, while, at the boiling point, it is dissolved in thirty parts." Its cold solution is opalescent; it is rapidly dissolved by pure alcohol, but only very slowly and sparingly in ether. By adding to it a small portion of sulphuric acid, it is immediately converted in a *super-sulphate*, the solubility of which in cold water, is much greater than that of the simple sulphate, without losing any portion of its medicinal properties. When exposed to a moderate degree of heat, the *sulphate* is deprived of its water of crystallization, and loses its crystalline form; when the heat is raised to two hundred and twelve degrees, it becomes phosphorescent, or luminous; and at a still higher temperature it undergoes fusion, acquiring the appearance of wax. According to Berzelius, the sulphate of quinia is composed of ten parts of sulphuric acid, 80.9 parts of quinia, and 9.1 of water. This salt is decomposed by alkalies and alkaline earths; and is precipitated from its solutions by potass, soda, ammonia, tartaric,

oxalic, and gallic acids, but these acids do not produce this effect when added in excess.

"The high price of sulphate of quinia has led to various attempts at adulteration. Sulphate of lime, sugar, mannite, starch, and stearin, are among the substances which have been fraudulently added. By attending to the degree of solubility of the sulphate in different menstrua, and to its chemical relations with other substances already mentioned, there can be little difficulty in detecting these adulterations. The presence of any mineral substances, not readily volatilizable, may be at once ascertained by exposing the salt to a red heat, which will completely destroy the sulphate of quinia, leaving the mineral behind."

According to researches of Pelletier and Caventou, the following are the constituent principles of the different kinds of officinal bark:

The pale bark of Loxa, contains, 1, a fatty matter; 2, a red colouring matter, being the cinchonic acid of Reuss; 3, a yellow colouring principle, readily dissolved by water and alcohol, and precipitated by the acetate of lead; 4, tannin; 5, gum; 6, starch; 7, lignin; 8, kinate of lime; 9. *kinate of cinchonia, and a very minute proportion of kinate of quinia.*

Yellow Calisaya bark contains "the fatty matter, the red colouring matter, the yellow colouring matter, tannin, starch, lignin, kinate of lime, and *acidulous* kinate of quinia, with a comparatively small proportion of kinate of cinchonia."

"*Red bark* contains the fatty matter, a large quantity of cinchonic red, the yellow colouring matter, tannin, starch, lignin, kinate of lime, and *a large proportion both of acidulous kinate of quinia, and of acidulous kinate of cinchonia.*"

"*Carthagena bark* contains the same ingredients with

the red bark, but in different proportions. It yields, moreover, its alkaline matter with much greater difficulty to water."

From an accurate and extensive series of experiments by MM. Pelletier and Caventou, it appears that when cinchona is subjected for a considerable length of time to the action of boiling water, the cinchonia in combination with the kinic acid is dissolved, together with some gum, starch, yellow colouring matter, tannin, and a portion of red matter, kinate of lime, and generally a portion of fatty matter. By reason of the simultaneous existence of these various substances in the decoction, it soon loses, on becoming cool, its clear colour, in consequence of a new compound, insoluble in cold water, formed by the combination which takes place between the tannin and the starch. A part of the red and fatty matter at the same time falls to the bottom, carrying with it a portion of the cinchonia, by which the active principle of the preparation is diminished. To obviate these circumstances in some degree, MM. Pelletier and Caventou recommend that a much larger quantity of water than usual be employed in making the decoction, in order to keep the whole of the cinchonia in solution; to filter it when cold, and afterwards to concentrate it by slow evaporation.

A better plan, according to Drs. Wood and Bache, (Dispensatory of the United States,) "is to add to the liquid some acid which may form with the quinia and cinchonia compounds more soluble than the native salts. Lemon juice has been long employed as a useful addition to the decoction of cinchona, and we can now understand the manner in which it acts. Sulphuric acid in excess answers the same purpose. By acidulating the pint of water employed in preparing the decoction, with one fluid drachm of the diluted sulphuric acid,

(elixir of vitriol), we shall probably enable the menstruum to extract all the virtues of the bark."

Wine and alcohol extract very completely the active principles of cinchona. According to MM. Pelletier and Caventou, the alcoholic preparations contain the largest proportion of cinchonia, and constitute, therefore the most powerful preparations of this remedy.

It is sometimes infused in lime water, and by many this preparation is particularly recommended for children. In the American Pharmacopœia there is a formula for an infusion of cinchona, in which it is directed to triturate the bark with magnesia, previous to infusing it. When prepared in this way it is much stronger than when infused without the magnesia. This substance possesses the remarkable property of increasing, to a very considerable degree, the solubility of resins, balsams, camphor, and oils; and as it appears that the active principle of cinchona resides chiefly in its resinoid part, it is upon this principle, no doubt, that the magnesia acts in increasing the strength of the aqueous infusion.

MM. Pelletier and Caventou have shown, that when an alkali or alkaline earth is added to an aqueous decoction or infusion of cinchona, the quinia and cinchonia is precipitated by the alkali, and the liquid, when filtered, is almost entirely inert. As cinchonia is, however, fully soluble in alcohol, there can be no objection, as these gentlemen observe, to the practice which has been recommended by some, of exhibiting the tincture of bark in combination with an alkali. "The gallic, oxalic, and tartaric acids also, and the substances which contain them, form salts with the alkaline principles of the bark, which are but slightly soluble, and should, therefore, be excluded from the decoction."

It is a singular and important fact that tartar emetic,

given in union with bark, loses almost entirely its emetic power. It appears that when these two articles are united, a partial decomposition takes place, the oxyde of the antimony uniting with the tannin of the bark, while the cinchonine is set free.

The salts of iron, sulphate of zinc, nitrate of silver, oxymuriate of mercury, tartarized antimony, solutions of arsenic, and various vegetable infusions and decoctions, as those of galls, chamomile, columbo, cascarilla, horseradish, cloves, catechu, orange-peel, foxglove, senna, rhubarb, valerian, simarouba, and cornus florida, form precipitates with the solutions of bark. These substances, do not, however, lessen the medicinal properties of the infusion, for they do not change, or in any way affect the active principles of the bark.

Therapeutic employment.—Mr. Alibert justly observes, that the history of cinchona is very intimately associated with that of intermittent fever, both from the circumstances which attended its introduction into regular practice, and the high character which it has long held and still sustains, as a remedy in this disease. Of its very superior efficacy in intermittents, it would now, indeed, be altogether useless to adduce any evidence. Upon this subject the profession may be considered as unanimous. The only difference of opinion which yet prevails in relation to the employment of cinchona in these fevers, relates to the mode of administering it; the periods of the intermission at which it should be given; the proper doses; and the utility or inutility of a previous resort to evacuant remedies.

With regard to the propriety of evacuating the stomach and bowels, previous to administering the bark, considerable difference of opinion has been expressed by writers. Although some have expressed doubts as to the usefulness or necessity of employing

purgatives and emetics preparatory to the use of the bark, yet general experience is decidedly in favour of the practice. Without doubt, many cases of intermittent fever may be effectually removed by bark, without any previous evacuations. This is most apt to be the case in those instances which occur during spring or winter, in subjects who have had the disease during the preceding autumn; and which may, therefore, be regarded as relapses of the former attacks. In intermittents occurring in summer and autumn, in miasmatic districts, and where the biliary secretions are much affected, an emetic, followed by a dose of calomel and jalap, is in general a very useful measure previous to giving the bark. There is, too, sometimes, a phlogistic tendency in the system which is unfavourable to the febrifuge operation of the bark, and in such cases cathartics will act beneficially, by reducing the general excitement of the system.

Bleeding also is an important preliminary in some cases of intermittents, before using the bark. I have had many examples of this kind in my own practice. The tendency to inflammatory action in the system is sometimes so great as to prevent the full development of the intermittent in its regular form; the intermission is incomplete, attended with restlessness, and an irritated state of the pulse; the cold stage is not marked by strong rigors, but only by creeping and protracted chills; and the hot stage does not terminate by a profuse and universal perspiration. In such cases the bark can seldom be employed with advantage, unless venesection and other evacuants be premised. By one efficient bleeding and cathartic, in instances of this kind, the fever will commonly assume its genuine character; the rigors will be strong; the perspiration which concludes the hot stage, copious and general,

and the intermission perfect. The bark will now act beneficially, however ineffectually it may have been employed previously.

Considerable diversity of opinion has been expressed in relation to the proper time for exhibiting bark in intermittents. Dr. Home gave it at the commencement of the hot stage. Heberden gave as much as four ounces immediately before the accession of the paroxysm; and Drs. Clark and Balfour, and others, recommended it to be given in the hot stage. The proper period for administering bark is, however, undoubtedly during the intermission. Upon this point the profession are now, I believe, unanimous.

Cinchona should always be given in as large doses as the stomach will bear. In general, from one to two drachms of the powder may be taken every hour. Some delicate stomachs will reject the bark when administered even in the smallest quantities. When this is the case, it may be given in the form of decoction or infusion, or administered as a clyster. "With children who cannot be prevailed on to take the bark, we may administer it with much efficacy in this way, repeating the clyster every four hours." It has also been used effectually in children, by applying it externally, quilted in a shirt or waistcoat.

When the bark occasions purging, it must be given with the addition of small doses of opium. This is, indeed, frequently a very important addition to the cinchona. It not only prevents the bark from acting on the bowels, but enables the stomach to bear much larger doses of it, and adds, moreover, in many instances, considerably to its good effects. The snakeroot may also sometimes be very usefully combined with the bark. Dr. Thomas says that this combination is particularly useful in intermittents of long continu-

ance, affecting old debilitated persons, living in a damp situation, or when the season is rainy. I have myself occasionally given a combination of bark, opium, and snake-root, in cases of this kind, and the effects have, in general, been very favourable.

Bergius speaks very highly of a combination of bark and mustard in this disease. The late professor Barton recommended a mixture of cinchona and black pepper as an exceedingly efficacious remedy in intermittents. The black pepper, indeed, appears to be a remedy of very considerable powers in this disease, if we are to credit the account given of its effects by Dr. L. Frank. This physician cured intermittents readily by giving his patients from five to eight grains of pepper twice a day. Dr. Ghigini confirms this statement.*

At present, however, the *sulphate of quinia* is almost universally employed in preference to the bark, or any of its other preparations, for the cure of intermittents. The highly contracted state of the tonic powers of the cinchona, furnished in this preparation, and the comparatively small portions which suffice to arrest the disease, renders it altogether the most eligible preparation of the bark, not only in this, but in every other disease, where the cinchona is indicated. Given in doses of from one to two grains every hour during the intermission, it will do all that can be effected by the most liberal employment of the bark in substance.

Dr. Alibert, who has published a highly interesting work on *malignant intermittents*,† observes, that the bark is our only remedy when the disease assumes this character, and that he has known this inestimable remedy arrest, as if by magic, the delirium, convulsions, colliquative sweats, suffocating dyspnœa, lethargy, and

* Journal Complementaire de Dictionaire des Sciences Medicales.

† Traité sur le Fievres Pernicieuses Intermittentes.

excruciating pains in the head, which attend this variety of the disease. This writer also observes, that the epidemic constitution of the atmosphere occasionally impresses such a peculiar character on intermittent fevers, as to render them incapable of being cured by the bark.* Hillary speaks of an epidemic intermittent at Barbadoes, in which the bark was of no avail, unless combined with saline remedies, or some of the tonic bitters. M. Boulou, also, mentions an epidemic intermittent, in which the cinchona was found ineffectual.

When visceral obstructions accompany intermittents, the bark is a remedy of doubtful efficacy. This is more especially the case where the diathesis is considerably inflammatory. When the obstructions occur in weak and phlegmatic habits, I have, however, seldom found any very particular obstacles to the successful operation of the bark. In cases of this kind, a gentle mercurial impression will, in general, either remove the disease, or render it more manageable by the bark. Dr. Barton observes that bark, combined with mercury in a small proportion, is one of the best medicines for removing the swelling of the spleen, which so often occurs after intermittent fevers.†

Remittents.—After the inflammatory excitement has been somewhat moderated, by antiphlogistic measures, bark given during the remission has been recommended by some writers, as not only a safe, but a highly useful remedy. Judging from my own experience, however, I am decidedly of opinion, that the practice is, in general, not a safe one, except it be resorted to in the decline of the disease, when the exacerbations are not marked by strong vascular action, and the remissions attended with a cool and moist skin, and a small, compressible

* Elemens de Therapeutique, vol. i. p. 51.

† MS. notes of Dr. B. S. Barton's Lectures on the Mat. Med.

pulse. It has already been stated, that where the pulse remains irritated and tense, and other symptoms of an inflammatory tendency in the system be present, in *intermittents*, the cinchona will not only frequently fail to remove the disease, but aggravate its symptoms. This being the case we can hardly presume that the bark would be useful in remittents, in which there is always some febrile action present, however complete the remission may be. When the patient has been worn down by the long continuance of the disease, and proper evacuations have been premised, bark may, no doubt, be employed with considerable advantage in this form of fever.

In certain stages of *typhus fever*, bark is a remedy of considerable utility. During the stage of excitement, it is, however, wholly inadmissible. When the disease is somewhat advanced, and the powers of the system begin to sink, bark, in conjunction with stimulants, given in moderate quantities, will sometimes produce salutary effects. Where, in the latter stages of the complaint, the tongue and skin are dry, and delirium, or coma, with convulsive twitches attend, the bark is, however, by no means, a proper remedy. Here camphor is, perhaps, our most valuable remedy. It is in the state of convalescence, that the cinchona displays its salutary powers; but, in every other period of the disease, where the powers of the system require support, it is decidedly inferior to some of the more diffusible stimulants, such as wine, volatile alkali, opium, musk, &c.

It must be observed, that in all febrile affections, where symptoms indicative of inflammation of the mucous membrane of the alimentary canal are present, bark is always highly pernicious, however great the prostration may be. When in the latter stage of low fevers, the abdomen is tender to pressure, and the

tongue red, or dry and brown, nothing can be more injurious than the employment of this tonic. No degree of prostration can justify the administration of bark, under circumstances of this kind. In general, the Peruvian bark may be deemed an improper remedy, in all diseases where there is considerable irritation of the mucous membrane of the alimentary canal.

The bark has also been highly recommended by some writers, in acute rheumatism and gout. In the former of these diseases, its powers have been particularly extolled by Morton, Fothergill, Saunders, and Haygarth. This latter writer states, that for many years he gave it in this disease in doses of from grs. v. to xv. every two, three, or four hours, having previously evacuated the stomach and bowels by means of antimony; and if this quantity proved beneficial he gradually augmented the dose to grs. xx. xxx. xl. taking particular care never to increase the dose beyond what agreed with the patient. He observes, that under this treatment, in the great majority of cases, "the pains, swellings, sweats, and other symptoms of inflammatory fever manifestly and speedily cease, till health is perfectly restored."

Of the propriety of this practice, however, there is reason to entertain much doubt. From my own experience I can say nothing either for or against it, having never employed it in this disease; but from the known properties of the bark, we may infer, *a priori*, that it is a medicine which can be seldom employed in the acute form of rheumatism, whilst the inflammatory fever continues, without doing injury. After the sympathetic fever has been reduced by proper evacuants, and other antiphlogistic measures, the bark may, no doubt, be resorted to with advantage. Dr. Scudamore observes, that when the convalescence begins—when the tongue is becoming clean, the urine assuming a light specific gravity, the bowels acting regularly, and the

skin relaxed and soft to the feel, he has found the bark, administered either as Dr. Haygarth directs, or in decoction with its tincture and sulphuric acid, a valuable medicine. Under opposite circumstances, however, he considers its employment of very doubtful efficacy.*

Acute rheumatism, occurring in autumn, or in miasmatic districts, sometimes assumes a remittent, and even an intermittent type, the biliary organs being prominently disordered. In cases of this kind, the bark may be employed with much advantage, after the alimentary canal has been well evacuated by emetics and mercurial purges.

Dr. Tavares,† a Portuguese physician, speaks very highly of the remediate powers of bark in gout. He says in the words of Dr. Held, whom he quotes in favour of this remedy: "Uno verbo, cortex peruvianus in podagra *divinum* est *remedium*." It is also recommended by Drs. Small and Saunders as decidedly useful when administered in large doses during the intermissions of pain and fever, after the local inflammation has been abated.‡ It does not appear, however, that this practice has ever been much pursued, and very few, I presume, would now be willing to adopt it. In the irregular form of this disease, where great debility attends, bark may be employed with advantage; but in the majority of cases of regular gout, it cannot be resorted to with safety. The late Dr. Barton used to state in his lectures, that he had observed the bark to be particularly pernicious in gout, when it evinced a tendency to shift its situation to the stomach, lungs, or brain.

* Scudamore on Gout and Rheumatism, p. 302.

† Observationes et Epicrisis de Corticis Peruviani salutari et proficus usu in Podagra. See Scudamore on Gout, p. 121. Philad. edition.

‡ Scudamore.

According to some British writers, the bark is a remedy of very considerable efficacy in erysipelas. Fordyce gave it in drachm doses every hour, and, as he informs us, with the most decided advantage. Sir G. Blane, also, in his Medical Logic, observes; "bark is the best remedy in erysipelas," and he adds, that his success with it has equalled Dr. Fordyce's. Instances of the successful employment of the bark in this disease are also related by Dr. Parkman.* When the attending fever is of a typhoid character, and the local affection manifests a tendency to gangrene; or in the erysipelas of old and debilitated habits, the bark is, indeed, a highly useful remedy. In several instances that occurred to me during the last few years, I derived great advantage from the free employment of the sulphate of quinia, after proper evacuations. This tonic will also frequently prove very beneficial, when, after the local inflammation has nearly subsided, the patient is left in a state of considerable debility. In the ordinary cases of erysipelas, however, where the system is plethoric, or the febrile excitement active, the employment of bark is decidedly contra-indicated, and can seldom fail to do mischief when given in the active period of the disease. In a late work there is a form of erysipelas described under the name of *erysipelas phlegmonodes*, which is said to be very prevalent in the British navy, and in which bark with mineral acids may be given with much benefit, when it occurs in persons advanced in life, or of a weak habit, and assumes a typhoid character.†

In *scarlatina anginosa*, the bark has been much recommended by some writers. In the last stage of this complaint, where there is great prostration of strength,

* New-England Journal of Med. vol. xii. p. 132.

† Surgical Observations, by Mr. Copeland Hutchinson.

with symptoms of malignancy and putrescency, and a tendency to gangrene in the throat, the bark is undoubtedly a medicine calculated to do good. In the simple form of scarlatina, however, the bark is inadmissible, except, perhaps, as a tonic during the state of convalescence; and even here it will seldom be necessary or very useful. Nor can this tonic be employed in the malignant variety of the disease during the inflammatory stage, without the risk of doing a great deal of injury. Formerly it was customary to prescribe the bark in the early stage of this variety of the disease, but the experience of the profession is now universally opposed to this practice. Bleeding, purging, emetics, cold and warm affusions, are the remedies to be relied on during the stage of excitement, in both the simple and malignant forms of the disease.

Not much can be said in favour of bark in the cure of epilepsy and tetanus. In the former of these complaints it was once a good deal prescribed, but it does not appear to be entitled to any particular attention for its powers in this way. In tetanus it was employed by Dr. Rush, and he speaks favourably of its effects. Dr. Morrison, in his excellent work on tetanus, observes, what indeed will be readily assented to, that the disease being conquered, the patient should take wine and bark for many weeks. I have, however, never heard of any case in which the bark effected a cure; in the cases in which it appeared to do good, it was given in conjunction with the free use of wine, to which latter we may, I think, fairly attribute the benefit which may have been derived from such a combination.

Of the use of bark in chorea, Dr. Cullen entertained a very favourable opinion. I have seen one case effectually cured by the bark, together with a few purges. The patient was a very delicate girl, about

twelve years old, very debilitated before the disease came on, and of a strumous habit. She took the bark in forty grain doses, four times a day, having previously evacuated the contents of the bowels by purgatives, and was cured in about three weeks. In general, however, I should not be inclined to use the bark in this disease, except in the state of convalescence, at which time it may be serviceable. I am fully satisfied, from what I have seen, that the purgative plan of treatment recommended by Hamilton, with the occasional employment of gentle tonics or antispasmodics, will, in the majority of cases, be more effectual than any other plan of treatment with which we are at present acquainted.

Pertussis is another of the spasmodic diseases in which the Peruvian bark has been particularly recommended. Dr. Morris appears to have been the first who employed the bark in this disease, and his report of its effects are very favourable. He gave it with castor.* Cullen observes, that in the advancement of the disease, when the cough is kept up by habit, and no pulmonary congestions are present, the bark may put an end to the disease. Many of the German writers speak particularly in favour of the bark in this disease. In this country it is, I believe, very seldom, if ever, given; and except under the circumstances mentioned by Cullen, it does not, I am inclined to believe, deserve much attention.

Bark has been also much prescribed in asthma. In the paroxysm it can be of no service; but, where the disease is connected with a cachectic state of the system, attended with indigestion, this, in common with other tonics, may be employed with advantage.

In *pulmonary consumption* the bark has been recommended by some writers as a useful remedy. Observing

* Medical Observations and Inquiries, vol. iii. p. 281.

that this disease is marked by periodical paroxysms, with pretty regular cold fits, followed with heat, and at last, copious sweats, succeeded by a temporary abatement of all the symptoms, physicians were led to suppose, that as the bark is so valuable a remedy in intermittents, which are characterized by a similar train of symptoms, it might be employed with advantage in phthisis. Experience, however, has proved that it is not only of no value in this disease, but uniformly pernicious in its operation. "I have seen the bark given," says Dr. Fothergill, "in almost every state of phthisis pulmonalis, even in the first commencement, whilst the breast was in pain, the cough dry and harsh, the pulse quick and hard, and the heat considerable. What was the consequence? Frequently an hæmoptysis, and all its worst attendants—ulcerated lungs, purulent spitting, colliquation, and death."*

This writer states, that symptoms resembling those of genuine phthisis, are sometimes produced by delicate mothers suckling their children longer than is consistent with their ability. In cases of this kind, he observes, the bark given early and in moderate doses, often produces very excellent effects; and adds, that he is satisfied, that by this remedy, he has "retrieved many from deplorable situations," and that, under such circumstances, a prudent employment of the remedy may be made with safety and advantage.

Where symptoms of consumption supervene, in consequence of copious discharges from abscesses, fluor albus, or other similar debilitating evacuations, the bark is a useful remedy, provided the lungs be not yet inflamed. If, however, the breathing is oppressed, the cough dry, the pulse quick and hard, with shooting

* London Medical Observations and Inquiries, vol. v. p. 347.

pains through the chest, the bark will inevitably increase the disease.*

There is another variety of consumption in which the bark may sometimes be beneficially employed. It is that species of the disease which has been lately described under the name of *dyspeptic phthisis*. In the early stages of this complaint, whilst the affection of the lungs is as yet sympathetic, the moderate employment of bark, with laxatives, may be attended with very beneficial results. It is, however, decidedly pernicious, whenever the pulmonary organs become the seat of inflammation or organic alterations.

In *catarrhal phthisis*, or as it is more properly called, *chronic bronchitis*, where the expectoration is copious, and the system much debilitated, much benefit may sometimes be derived from the free use of this tonic. I have prescribed the sulphate of quinia in conjunction with balsam copaiva, with advantage, in a few instances of this affection. Dr. Hastings states, that when given in union with the diluted sulphuric acid, the Peruvian bark tends to restrain the profuse night-sweats, and to improve the secretions from the mucous membrane of the lungs. I have used quinia in union with the extract of conium with decided benefit in chronic bronchitis succeeding hooping-cough.

Of the use of bark *in dyspepsia*, I have no very favourable opinion, when the disease is once completely formed, and the lungs or liver brought into a morbid condition. In mere weakness of the stomach, giving rise to flatulence and acidity, the bark, either by itself or in combination with iron, may be used with advantage; but in that fixed form of the disease, in which the mind and body are equally unfitted both for the enjoyments and

* Dr. Fothergill.

duties of life, the bark, and indeed all tonics, must be administered with great circumspection.

In *scrofulous complaints* the bark is a remedy of very considerable powers, and deserves to be placed among our most useful medicines in this disease. "In tumefied glands, where the habit happens to be feeble, and the circulation weak, from constitution or accident, bark is a most efficacious remedy; and, what is remarkable, acts as a resolvent and discutient."* Dr. Fordyce observes also, that much may be done with this remedy in scrofulous ulcerations, or in "gleety, phagedenic, and semi-gangrenous sores." In debilitated persons of a strumous habit, the bark, with cold bathing and iron, is a very valuable remedy. Bark, in combination with the mineral alkali, has been known to remove scrofulous swellings, when no other form of this medicine would have the least effect.† In a few cases of scrofulous ulcerations, I obtained much advantage from the bark given conjointly with cicuta and minute portions of corrosive sublimate. In this stage of the complaint, however, we can very seldom procure complete relief by any mode of treatment which has hitherto been devised. In scrofulous, or exanthematous *ophthalmia*, the *sulphate of quinia* is a most excellent remedy. Dr. Mackenzie, of Glasgow, asserts, that in the majority of instances of this affection, in which he employed this remedy, its beneficial effects "were very remarkable." In most of the little patients "to whom the quinine was given, it acted like a charm." Sir A. Cooper, also, speaks in the most favourable terms of the effects of this remedy in scrofulous inflammation of the eyes.

* An Account of some Virtues of the Peruvian Bark, not generally known nor described, particularly in Scrofulous Cases, by John Fordyce, in Med. Observ. and Inquir. vol. i.

† MS. Lectures of the late professor Barton.

My own experience enables me to bear testimony to the great usefulness of this tonic in this form of ophthalmia. I have prescribed it in nine or ten cases, and in every instance with unequivocal advantage. Before having recourse to this remedy, the disordered state of the alimentary canal should be corrected by mercurial purgatives, and a mild and digestible diet.

The bark has also been recommended as very serviceable in certain varieties of *dropsy*. Where, for instance, anasarcous swellings depend on mere debility, and no visceral obstructions exist, the bark, as a general roborant, is a remedy of excellent powers. In combination with cream of tartar, it is said to be peculiarly efficacious in the dropsies which succeed intermittents. I should doubt, however, its general applicability in cases of this kind, since dropsies from this cause are very commonly connected with visceral indurations; a circumstance which experience shows to be especially unfavourable to the salutary operation of this remedy.

In *hemicrania*, when, like an intermittent, it returns at regular periods, the bark is the best remedy with which we are acquainted. I have usually combined it with valerian, and administered it in large doses. It is always useful to evacuate the stomach and bowels previously to employing this remedy. In *periodical* neuralgia, we possess no remedy equal in efficacy to the bark or quinia. Given in *large* doses it often arrests the disease in a short time. In all painful affections of a periodical character, the quinia is a highly efficacious remedy.

The Peruvian bark is also very commonly prescribed in gangrene. When the gangrene depends on deficiency of action, this remedy is of unquestionable utility. Where it depends on increased action or inflammation,

the bark is always injurious if it be given before the general inflammatory excitement has subsided. To promote the separation and sloughing of dead parts, however, and support the sinking powers of the system during this process, after the general inflammatory action has disappeared, the bark may be very advantageously resorted to. It is usually given in combination with opium, volatile alkali, or wine, and its powers are much assisted by these articles. In *cancerum oris*, or the sloughing ulceration of the gums and cheeks of children, the quinine is, perhaps, the most effectual internal remedy we possess. I have derived the greatest benefit from the free use of this tonic in several instances of this kind.

Having now given an account of the therapeutic application of the bark, it remains for me to say something concerning its preparation, and modes of exhibition.

With the exception of the sulphate of quinine, the best form for exhibiting the bark, undoubtedly, is in substance. The stomach, however, will sometimes reject it when taken in this way, and in this case it should be given in the form of an infusion, conjointly with the tincture. When thus administered, it will, in general, remain very easy on the stomach. By giving the infusion and tincture together, we obtain all the power of the bark residing both in its gummy and resinous principles—an advantage which cannot be so completely had by using these preparations separately.

If the bark disagrees with the stomach in whatever shape it be taken, it may be beneficially employed in the form of a clyster. Administered in this way it is particularly applicable to the diseases of children, where it may be necessary to employ this remedy. The bark may also be advantageously used as an external appli-

cation, either in the form of powder quilted into a waistcoat, or of decoction, as a bath. Dr. Alexander states, that he cured intermittents by immersing the lower extremities in a decoction of bark, when the stomach rejected the medicine.

The sulphate of quinia is, without doubt, the most valuable preparation of the cinchona, we possess; and it has now in a great degree superseded the employment of the bark in periodical affections. Experience has, indeed, fully established its excellent powers, as a remedy in intermitting fevers and other analogous *periodical* affections usually treated by tonics. As a general tonic, it does not, however, appear to be equal to the bark in substance. In general debility and relaxation of the system, in extensive suppurations, in gangrene, &c. the sulphate of quinia seldom procures the advantage that may be obtained from the cinchona itself. Occasionally, this preparation acts strongly upon the alimentary canal, producing violent purging or vomiting. When it causes purging, the best corrective is the addition of a small portion of the sulphate of zinc—a combination which is peculiarly beneficial in intermittent fevers. In general, its stimulant powers are much more active than those of the cinchona in substance. A full dose is usually followed by a manifest increase of the temperature of the surface, and a feeling of tension and fulness in the head. Its tendency to determine the blood to the brain, is, indeed, very considerable. When full and frequent doses are taken, the countenance generally becomes flushed, and the vessels of the head turgid, attended with a sense of confusion, heaviness of the head, and often ringing in the ears. In three instances under my own observation, the cerebral congestion produced by this article, was so violent as to give rise

to a singular form of delirium, resembling the mental derangement which is excited by an over-dose of stramonium.

It is prepared in the following manner:—Boil, for half an hour, two pounds of the appropriate bark in powder, in sixteen of distilled water, acidulated with two fluid ounces of sulphuric acid—strain the decoction through a linen cloth, and submit the residue to a second ebullition, in a similar quantity of acidulated water: mix the decoctions, and add, by small portions at a time, powdered lime, constantly stirring it to facilitate its action on the acid decoction. (Half a pound is near the quantity requisite.) When the decoction has become slightly alkaline, it assumes a dark-brown colour, depositing a reddish-brown flocculent precipitate, which is to be separated by passing it through a linen cloth. The precipitate is to be washed with a little cold distilled water, and dried: when dry, it is to be digested in rectified spirit, with a moderate heat, for some hours: the liquid is then to be decanted, and fresh portions of spirit added, until it no longer acquires a bitter taste. Unite the spiritous tinctures, and distil in a water bath till three quarters of the spirit employed be distilled over. After this operation, there remains in the vessel a brown viscid substance, covered with a bitter, very alkaline and milky fluid. The two products are to be separated and treated as follows: to the alkaline liquid, add a sufficient quantity of sulphuric acid to saturate it; reduce it, by evaporation, to half the quantity; add a small portion of charcoal, and after some minutes' ebullition, filter it while hot, and crystals of *sulphate of quinia* will form. These are to be dried in bibulous paper. Two pounds of the bark will yield about five to six drachms, of which eight grains are considered equal to an ounce of bark. This is the younger Henry's pro-

cess, modified by Paris. The dose of this preparation varies from one to five grains; but the usual dose when a frequent repetition is required, as in intermittents, is from one to three grains. For the mode of prescribing it see formulæ.

The acidulous phosphate of quinia has recently been strongly recommended by Professor Harleso. He asserts, that it is, generally, much more easily supported by irritable stomachs, than the sulphate; and that it is preferable, moreover, in subjects of a nervous temperament, and in those who are liable to sanguineous congestions or inflammations. "It never produces that kind of uneasiness which we sometimes observe to follow the administration of the sulphate, and it has, besides, the advantage of exciting the heart less powerfully, and of occasioning no irritation of the respiratory organs." It is but slightly soluble in water and alcohol, and is best given in the form of a pill or powder. The dose is from one to four grains.*

The extract of cinchona was formerly a good deal employed, particularly in the diseases of children, requiring tonic remedies. From the experiments of Pelletier and Caventou, however, it appears that this preparation possesses but feeble tonic powers. The extract made by maceration in cold water is more active than that prepared by decoction or infusion. The alcoholic extract possesses considerable powers; but it is, nevertheless, much inferior to the sulphate of quinine, or the bark in substance.

The alkaline principles of the cinchona, in their simple state, that is, without being combined with an acid, have also been employed in practice; and it would appear that their powers are but little inferior to those

* Heidelberg Klinische Aunal, vol. v. p. 535. Archives Générales. Aug. 1830.

of the sulphate of quinine. Nieuwenhius employed both the cinchonia and the quinia. The former appears to be less efficacious than the latter, and is, moreover, apt to disagree with the stomach, and to excite vomiting. Elliotson also employed the quinia in its simple state, and his experience led him to consider it fully equal to the sulphate. He prescribed it in doses of five grains every six hours in intermittent fevers, with entire success. As the simple quinia is much more easily prepared, and at much less expense than the sulphate, it would appear to be well entitled to the attention of the practitioner.

The tincture of cinchona made with diluted alcohol, contains much of the active properties of this article. In affections or states of the system, where tonic and stimulating remedies are indicated, as in the low states of typhus fever, this tincture constitutes an excellent remedy. It is, however, much too stimulating to render it a proper medicine in intermittents, and other affections where the liberal use of the bark may be required. In mere gastric debility, with a relaxed and torpid state of the general system, the *compound tincture of bark* (Huxham's tincture) is often a very useful medicine. In the convalescence of fevers, where the general languor and debility is considerable, an excellent mode of administering the bark is to give the watery infusion and tincture in combination. A wine-glassful of the infusion, with a tea-spoonful of the tincture may be given at a dose, and repeated according to the degree of debility and relaxation. In this way all the powers of the bark are obtained, and in a form which generally agrees much better with the stomach than either the cinchona in substance, or the sulphate of quinine.

When employed in the form of *infusion*, or decoction, a small portion of sulphuric acid should be added, which,

combining with the active principles of the bark, renders them much more soluble, and thereby greatly increases the strength of the infusion. About a drachm of the diluted sulphuric acid, or elixir of vitriol will suffice for a pint of infusion or decoction.

Formulæ.

℞.—Pulv. cinchonæ flav. ℥i.
Elix. vitriol. ʒi
Aq. bullientis. ℥xvi. Simmer it slowly down to ℥xii. Strain, and give a wine-glassful every hour or two.

℞.—Sulphat. quiniæ gr. xii.
Sulphat. zinci gr. iv.
G. aloes gr. iii.
Conserv. rosar. q. s.—M. Divide into ten pills.

℞.—Sulphat. quiniæ gr. xii.
Sulph. acid gtt. iii.
Syrup. limonis ℥i. M. Dose, a tea-spoonful.

℞.—Sulphat. quiniæ gr. xii.
Sulph. acid gtt. iii.
Extract. glycyrrh ʒiii.
Aq. menthæ ℥iv.
Aq. fontanæ ℥iv.—M. Dose, a table-spoonful.

℞.—Pulv. cinchon. flav. ℥i.
Pulv. serpentariæ ʒii.
Sodæ subcarbonat. ʒiss.—M. Divide into eight equal parts. Dose, one every two hours.

℞.—Sulphat. quiniæ ℈i.
Sulphat. ferri gr. x.
Extract. hyoscyam ʒss.—M. Divide into twenty pills.

An excellent combination, in chlorosis, and a leucophlegmatic state of the system, when free from febrile irritation.

ARISTOLOCHIA SERPENTARIA.—VIRGINIA SNAKE-ROOT.

This plant is found exclusively in the United States, and constitutes an excellent article of our indigenous materia medica. The root, which is the only part employed in medicine, is perennial, consisting of very numerous fibres, matted together, proceeding from a common head or caudex. The fibres are of a yellow

ochre colour externally, and of a pale-yellow within. The central or knotty part of the root is of a dark-brown colour. It has an agreeable aromatic smell, resembling that of valerian; its taste is warm, pungent, and bitterish, not unlike that of camphor or of the pinus canadensis. Subjected to the action of alcohol, "it affords a bright-green tincture, which is rendered turbid by water; by filtration a small portion of a green matter is separated, but its transparency is not restored. It neither precipitates tannin nor gelatine, nor affects the salts of iron or tincture of turnsole. When the diluted tincture is distilled, the spirits and tincture passes over milky, strongly impregnated with its peculiar odour." Lewis states that the spirituous extract is more powerful than the watery, "not so much from its having lost less in evaporation, as from its containing the active parts of the root concentrated into a smaller volume; its quantity amounting only to about one-half of that of the other." According to Chevallier's analysis, the root of this plant contains a volatile oil, a yellow, bitter principle, soluble in water and alcohol, resin, gum, starch, albumen, lignin, and various salts. Bucholtz obtained from 1000 parts, 5 of a green, fragrant, volatile oil; 28.5 of a yellowish-green resin; 17 of extractive matter; 181 of gummy extract; 624 of lignin, and 144.5 of water. Chevallier considers the yellow, bitter principle as analogous to the extract of quassia, called *quassin* by Dr. Thompson.

The snake-root was first brought into notice as a remedy for the bite of venomous serpents; and although soon found to be destitute of antidotal powers, experience showed it to be a remedy of very considerable value in a variety of circumstances.

When taken into the stomach it increases the force and frequency of the pulse, excites a glow of heat

throughout the system, and produces diaphoresis. It is not, however, simply stimulant and diaphoretic in its effects, for along with these qualities it possesses very important *tonic* powers. In excessive doses it often occasions nausea, severe tormina in the bowels, and occasionally dysenteric symptoms, particularly tenesmus.

Possessing, along with its tonic, pretty powerful stimulant properties, the snake-root is peculiarly suited to fevers of a low grade of excitement; for the same reason, however, it can never be employed without much risk of injury wherever blood-letting is indicated.

In every variety of fever, however, when the system is sinking into a typhoid state, the snake-root is a remedy of unquestionable utility. It is especially applicable in the latter stages of febrile diseases, when the skin and tongue remain dry and hot, and the pulse is feeble and frequent. When given in this state, it often excites a general diaphoresis; the tongue becomes moist, and the pulse and general powers of the system are invigorated.

A good deal has been said in favour of the powers of the serpentaria in putrid fevers, and from the general properties of this remedy, there can be little doubt of its applicability to the treatment of fevers of this kind.

The snake-root was formerly much employed in intermittents. Of its efficacy, however, in this disease, when administered by itself, not a great deal can be said. I have employed it in some instances, but almost always without success, and I am inclined to believe that it is not often capable of arresting the disease. When united, however, with bark or some of the bitter tonics, it seems to increase their efficacy, and it is in this way that it is now commonly employed in intermittent and remittent fevers. It is particularly useful, with Peruvian bark, in those intermittents where the

system is depressed and sluggish during the intermission, with a small and feeble pulse, and a cold and dry state of the surface of the body.

During the prevalence of the epidemic pneumonia typhoides, in this country, the serpentaria was much prescribed by some physicians. Being at once stimulant, diaphoretic, and roborant, it was peculiarly calculated to produce beneficial effects in this disease, by equalizing the circulation, and imparting vigour to the vital powers. Dr. Dyckman states, that he has prescribed the snake-root in combination with seneka, with marked advantage in this disease. It may also be employed with advantage in the latter stages of pneumonia and bronchial affections, attended with much prostration.

The infusion of this root forms an excellent gargle, in ill-conditioned ulcers of the throat.

The dose, in powder, is from twenty to thirty grains. It is usually given in infusion, of which a wine-glassful may be taken every half hour or hour. By boiling, its powers are almost entirely destroyed.

Formulæ.

℞.—Rad. serpentariæ ʒi.
Rad. columb. ʒii.
Cort. cinnamon. ʒi.
Aq. bullientis. vi.—M. Macerate for one hour. Dose, a wine-glassful.

℞.—Pulv. serpentariæ
Magnes. albi ää gr. xvi.
Pulv. rhæi gr. xii.—M. Divide into six equal parts. This is a very useful mixture in dyspeptic affections of infants.

GALIPEA OFFICINALIS, (CUSPARIA FEBRIFUGA.) ANGUSTURA BARK.

It is not a great while since this bark has been known to the profession; but it would appear from the

experience of those who have given an account of its remedial powers, to be entitled to very considerable attention. The Angustura bark is obtained from a small forest tree, growing in abundance in the woods near Carouy and Alta Gracia. It is also found in the valley of Santa Fe, between Cumana and New Barcelona,* and particularly in the woods near Carouy and Alta Gracia. The botanical character of this tree was not known until it was described by Humboldt and Bonpland. Wildenow, to whom specimens were sent by these enterprising and intelligent travellers, constituted it into a new genus, to which he gave the name Bonplandia. De Candolle, however, found that the generic character of this tree, as described by Humboldt and Bonpland, coincided fully with the genus *Galipea* of Aublet. Dr. Hancock afterwards ascertained that the tree described by Humboldt is not that from which the officinal Angustura bark is obtained, "but probably another species of the same genus, which these authors had mistaken for it, having been led into error by the imperfect specimens which they received." Hancock proposed the name of *Galipea officinalis* for this tree, which title is adopted in the Pharmacopœia of the United States.

The bark of this tree comes to us in small, slightly convex, wrinkled, and externally whitish pieces, of about four or five inches in length. It has a very bitter and slightly aromatic taste. Its odour is peculiar and nauseous. When pulverized it becomes of a pale-yellow colour.

According to M. Vauquelin, this bark does not precipitate animal gelatine, but it forms a copious precipitate with tartar emetic, iron, copper, lead, tin, bi-chloride

* Alibert.

of mercury, pure potassa, nitric and sulphuric acids, and by the infusions of galls and yellow cinchona. One of its principal chemical peculiarities therefore is, that it does not precipitate animal gelatine. M. Vauquelin thinks, too, that the principle which gives to this bark the power of precipitating metallic solutions, is not the same as that which gives a similar property to the Peruvian bark.* It appears that the Angustura bark contains resin, extractive, carbonate of ammonia, and an essential oil. Its active principle is readily extracted by cold and hot water, and it does not appear that long boiling injures its powers.† Alcohol also extracts its bitterness, but produces a precipitate with the watery infusion.

The Angustura bark is a stimulant tonic of very considerable powers; and is much less apt to nauseate or oppress the stomach than the cinchona bark. It is especially a useful tonic in cases of general muscular debility and relaxation, attended with an inirritable state of the system. When first introduced into notice it was highly extolled as a remedy in intermittent fevers; and although it has now lost much of its former reputation, there are still some highly respectable physicians who regard it as a remedy of very great power in the cure of intermittents. In intermittents attended with much weakness of the digestive functions, and general debility and relaxation, the Angustura bark is a peculiarly valuable remedy.—(Richter.) It may be very advantageously given in union with the cinchona; and Vogel asserts, that he has often succeeded in arresting the disease with this combination, after the bark given by itself had failed to do good.

It has also been recommended as particularly useful

* Alibert, Mat. Med. tom. i. p. 78.

† Paris's Pharmacologia.

in chlorosis. I have lately prescribed it in a case of this complaint, in combination with iron, and the effect was very beneficial. In this case, however, the iron may have been the most efficacious of the two articles in combination.

In dyspepsia, while the disease is yet entirely confined to the digestive organs, the Angustura bark may be beneficially given. I have used it in my own case, and obtained considerable relief from it. It is also said to be a very effectual remedy in diarrhœa, depending on a weakness of the bowels. In chronic and malignant dysentery, the Angustura bark is said to be a very useful remedy. Dreyssig asserts, that he has used it with great advantage in what he calls the putrid form of this disease; and Richter also speaks very favourably of its powers in diarrhœa and dysentery. In these affections I have never administered it, but I can readily believe, that in the former disease, and in the chronic form of the latter, it may be employed with advantage.

In powder it is given in the dose of from six to thirty grains. The dose of the decoction or infusion is from ʒi. to ʒii. When given in very large doses it has a tendency to produce nausea. The incompatible substances are: sulphate of iron, sulphate of copper, oxymuriate of mercury, nitrate of silver, tartarized antimony, subacetate and acetate of lead, potass.

False Angustura Bark.—The French writers on the materia medica describe a bark, under this title, which in Europe has, of late years, been frequently found mixed with the true Angustura, and which is said to possess very poisonous properties. It is much thicker, heavier, harder, and more compact than the genuine bark; it has a dull and blackish fracture; the epidermis is of a ferruginous, and the internal surface of a brownish colour; it yields, on being pulverized, a white, slightly yellow

powder. It is entirely destitute of odour, but possesses intense bitterness. It does not become tenaceous and soft by maceration in water, as does the genuine Angustura. According to Pelletier and Caventou, it contains a peculiar alkaline principle, to which they gave the name of *brucia*, and upon which its deleterious properties depend. "In consequence of the presence of this principle, a drop of nitric acid upon the internal surface of the bark, produces a deep red spot," and when the acid is applied to the external surface, its colour is speedily changed to a fine emerald-green. This bark is now generally referred to an unknown species of the genus strychnos.

Formulæ.

℞.—Cort. angusturæ
Flor. arnic āā ʒii.
Aq. fervid. ʒiv. Boil down to three ounces; strain, and add, Acet. vini.
Syrup. aurant. āā ʒi.
G. arab. ʒi.
Tinct. opii gtt. lx.—M. S. Dose, a table-spoonful every hour. This is highly praised as a remedy in typhoid dysentery. (*Richter.*)

℞.—Pulv. cort. angust.
Pulv. cinchon. flav. āā ʒss.—M. Divide into six equal parts. Dose, one every three or four hours.

COLUMBA.

This is the root of the *cocculus palmatus*, a native of Mozambique, on the south-eastern coast of Africa. Until a comparatively recent period, this plant was entirely unknown to botanists. In the year 1805, Mr. Fortin discovered it near Mozambique, and carried an offset from the root to Madras, from which "a plant was raised in the garden of Dr. Armstrong. From a drawing made of this plant, it was ascertained to belong

to the natural order of *menispermeæ;* but as the female flowers were wanting, some difficulty was experienced in determining the genus and species." It has, of late years, however, been referred to the genus *cocculus* of De Candolle, and, "in the Pharmacopœias of the United States and of London, the plant is recognized as the *cocculus palmatus*. The root, which alone is employed in medicine, is imported in transverse slices, from an eighth to a quarter of an inch in thickness. The bark of the root is rugous, thick, and of a greenish, verging to an obscure brown colour. The internal, or parenchymatous part of the root is yellowish. In general there are three distinct parts composing this root, the bark, the woody part, and medullary portion.* "Those pieces are to be preferred which have the brightest yellow colour, are most compact and uniform in their texture, and are most free from the worm holes by which the root is apt to be penetrated." It has a faint aromatic odour, and is intensely bitter and slightly acrid in taste. According to an elaborate analysis made of this root by M. Planche, it contains a kind of animal matter, which exists in it in very great proportion, and a yellow substance of an intensely bitter taste, which readily dissolves in water and alcohol. It also contains a very large portion of starch. By repeated distillation a volatile oil may be obtained from it; and it appears to contain a malate of lime and sulphate of lime.† About one-third of its weight is dissolved by boiling water; its best menstruum, however, is proof spirit, with which it forms a very beautiful and active tincture. More recently Mr. Wittstock, of Berlin, has obtained a peculiar crystallizable principle from the columba, which is intensely bitter, and for which he has

* Alibert, Mat. Med. tom. i. p. 96.

† Ibid. tom. i. p. 97.

proposed the name of *columbin*.* "It appears to be the yellow bitter substance of Planche, deprived of a part of its colouring matter." It crystallizes in transparent quatrilateral prisms, possessing no smell, but extreme bitterness. Water, alcohol, and ether dissolve it but sparingly at the medium temperatures. Diluted acetic acid is the best menstruum; alkaline solutions also dissolve it, from which it is speedily precipitated by acids. It possesses neither acid nor alkaline properties, "and its alcoholic and acetic solutions are not affected by metallic salts, nor the infusion of galls."

This is one of the purest and least astringent and stimulating bitters we possess. It has been prescribed in intermittents, but it does not appear to be particularly efficacious in this disease. It has also been recommended in phthisis; but, from what I have seen of its effects in this disease, I am not induced to believe that it is often useful, or even proper, in this hopeless malady.

The columba has also been recommended in diarrhœa and chronic dysentery. In the chronic bowel complaints of children, from debility of the alimentary canal, much benefit may, indeed, often be derived from this remedy. In the habitual diarrhœa of infants, I have seen much good done by giving once or twice daily a tea-spoonful of a mixture composed of half a drachm of extract of columba dissolved in an ounce of water, to which forty drops of the camphorated tincture of opium is to be added. Columba may also be advantageously employed in cholera infantum, when it assumes the chronic form.

The disease, however, in which it seems most decidedly beneficial, is indigestion. In this complaint it is one of the best tonics we can employ. I have fre-

* Journ. de Pharm. Fev. 1831.

quently prescribed the columba in union with ipecacuanha, with marked advantage in dyspeptic complaints. Ten or twelve grains of the columba may be given with two grains of the ipecacuanha. It is particularly valuable where there is a disposition to the accumulation of flatus in the bowels. In cases of this kind, Drs. Wood and Bache,* strongly recommend an infusion made of half an ounce of columba, the same quantity of ginger, and two drachms of senna, and a pint of boiling water. This should be taken in wine-glassful doses, thrice daily. It is to be observed, however, that neither this nor any other tonic can be advantageously or even properly given when the dyspepsia is attended with high irritation of the mucous membrane of the alimentary canal. It is only where the indigestion depends on debility and inactivity of the digestive organs, that articles of this kind can be used with a prospect of advantage.

The dose of the powder is from gr. xv. to ʒss.; that of the infusion from ʒiss. to ʒii. It may be given in combination with iron, rhubarb, or saline purgatives. The incompatible substances are, infusion of galls and yellow cinchona bark, subacetate and acetate of lead, corrosive sublimate and lime-water. The nitrate of silver, muriate of mercury, or tart. antim. do not affect it.†

Formulæ.

℞.—Pulv. columb.
—— subcarbonat. ferri.
—— rhæi.
—— zingiberis āā ʒi.—M. Divide into twelve equal parts. S. Take one three or four times daily.

* United States Dispensatory.

† In France, a spurious columba has been extensively substituted for the genuine root, which, according to M. Guibourt, has become rare in the markets of that country. Though similar to columba in appearance, it is different in properties, and is, therefore, truly an adulteration. It is said

℞.—Rad. columb. ℥i.
—— zingiberis ℥iii.
—— calom. aromat. ℥ss.
Sem. fœnicul. ʒi.
Aq. bullientis. vi.—Macerate for two hours. Dose, a table-spoonful four or five times daily.

℞.—Rad. columb. ʒi.
—— rhæi. ʒi.
Sem. anise ʒi.
Aq. bullientis. ℥viii.—Macerate for two hours, strain, and add to the infusion,
Syrup. zingiberis ℥iss.
——— papaver. alb. ℥ss.—M. Dose, a tea-spoonful to a child from one to three years old. This is an excellent combination in the habitual bowel complaints of children.

GENTIANA LUTEA.—GENTIAN.

This is a perennial plant, indigenous to the mountainous parts of Germany, France, &c. The root, which is the only part employed in medicine, is long, slender, branched, externally wrinkled, and of a grayish-brown colour, and of a yellowish colour within. Its taste is intensely bitter, but it has no particular smell. Both water and alcohol extract its active principles, but proof spirit appears to be its best menstruum.

According to M. M. Henry and Caventou, this root contains a peculiar principle, to which the name of

to be imported from Barbary, but the plant which yields it is not known. Though in round slices, like the genuine root, it has an epidermis of a *gray fawn* colour, marked with close and parallel circular striæ; its transverse surface is irregularly depressed; the medullary portion is of a yellowish orange, with a deeper coloured circle; the smell is weak, like that of the gentian; the taste *feebly bitter, and rather saccharine;* the powder is of a yellow fawn, instead of a greenish colour; but the most striking difference is the total absence of starch, which constitutes one-third of the columba. Iodine, therefore, is an excellent test. If the true columba be moistened with hot water, and touched with iodine, it immediately assumes a blackish colour; while the spurious root, treated in the same way, undergoes no change. The latter, also, gives a fine yellow colour to ether, which is not the case with the genuine root.—*U. S. Dispensatory.*

gentianin has been given; a fugitive colouring matter, a substance identical with bird-lime, a greenish fixed oil, a free organic acid, uncrystallizable sugar, gum, yellow colouring matter, and lignin. *Gentianin*, in which the active properties of the root are supposed to reside, is a yellow crystallizable neutral substance, very bitter, but without smell, "readily dissolves by alcohol and ether," but sparingly soluble in cold water, more so in hot water, and partially volatilized by heat.

Gentian is among the most active and useful of the pure tonic bitters; and is, perhaps, more frequently employed than any other article of this class of remedies. It possesses no astringency whatever; but it appears to be considerably more stimulant in its general operation than the columba. It is more apt than any of the tonic bitters to excite purging; though its effects in this way are seldom manifested, unless it be given in very large doses. Persons of an irritable or excitable habit of body, or of a sanguineous temperament, do not, in general, bear the gentian so well as the columba, from its greater tendency to heat and irritate the general system. From this exciting power, however, it is, on the contrary, peculiarly suitable as a tonic in individuals of a torpid, phlegmatic, and irritable habit. It is especially adapted to cases attended with a torpid and debilitated state of the digestive organs.

The gentian has been successively employed in combination with astringents in the cure of intermittents. Cullen says he never knew it to fail in curing intermittent fever, when given with galls or tormental. When given alone, however, its powers are much less certain and useful. Lind, also, commends it as an efficacious remedy in this disease. At present, however, it is very seldom used for this purpose, nor does it appear to be entitled to much credit for its virtues in this complaint.

As a tonic, in general debility, or in a weak state of the stomach and bowels, the gentian is an excellent remedy. It is particularly beneficial as a stomachic; and, in indigestion, it is, perhaps, the most useful of the bitter tonics. It has also been recommended in gout, particularly in the convalescent state, when much debility of the stomach is present. Gentian is an article in the composition of the famous Portland powder, which appears to have been employed with great advantage in preventing the paroxysms of gout.

The dose of the powdered root is from gr. x. to ʒi. It is also given in the forms of an extract, infusion, or tincture, all of which are excellent preparations.* In a large dose it is apt to purge.

The officinal preparations of this root are numerous; the following are the principal: *Extract. gentianæ; tinct. gentianæ; tinct. gentian. compos.; tinct. gentianæ cum ammoniæ*, Pharm. Gallic.; *tinct. amara; infusum gentianæ composit.*, Lond. Dub. and Edinb. Pharm.; *vinum gentian. compos.*, Ed. Pharm.

Formulæ.

℞.—Rad. gentian. contus. ʒi.
Carbonatis ammon. ʒii.
Alcoholis ʒxxxii.—M. Digest for four days. This combination is much used in France as a tonic in scrofulous affections, and constitutes a highly useful preparation in dyspeptic complaints, attended with acidity in the primæ viæ. Instead of the ammonia, a few drachms of the *carbonate* of *sodæ* may be taken.

℞.—Extract. gentianæ ʒi.
Sulphatis ferri gr. viii.
Pulv. ipecac. ʒss.
Mucilage g. arab. q. s.—M. Divide into thirty pills. Dose, one pill, three times daily.

* "*Brodum's Nervous Cordial* consists of the tincture of gentian, columba, cardamon, and bark, with the compound spirit of lavender, and wine of iron.

"*Staughton's Elixir* is a tincture of gentian, with the addition of serpentaria, orange-peel, cardamus, and some other aromatics."—*Paris's Pharmacologia.*

The quassia excelsa is a large tree growing spontaneously in Surinam, from which its wood was first brought into Europe in the year 1761.

The wood of this tree, and more especially that of the root, is of a pure and intensely bitter taste, which, according to Thomson, depends on a peculiar bitter principle to which the name of *quassin* has been given. According to Crell and Tromsdorff, the *quassia* contains a greater proportion of gummy matter than of resinous, and hence they infer that the infusion of it in cold water is its best preparation. The nitrate of silver and the acetate of lead are the only substances, in common use as medicines, which produce precipitates with the infusion of quassia.

The quassia is a very excellent tonic, and may be very usefully employed in all cases where remedies of this kind are indicated. It possesses scarcely any stimulating or heating properties, and is, therefore, peculiarly calculated to improve the digestive powers of the stomach in weak and very irritable subjects. It was at one time a good deal employed in the cure of intermittents. It has, however, not sustained its reputation in this disease, and is now but very seldom employed in its cure. It is said to be very efficacious in suppressing bilious vomitings, attending bilious and putrid fevers. Alibert states that he succeeded in curing a female, by this remedy, of habitual vomiting, which had prevented her for a long time retaining any nourishment on her stomach. He also says, that he has used the quassia with much success in cases of dyspepsia. In the depraved appetite in chlorosis, particularly when there is a disposition to eating dirt,

chalk, &c. the quassia is said to be a very efficacious remedy.*

As a stomachic, it is, indeed, one of our best remedies; it is said to be especially useful in indigestion arising from intoxication. When administered in combination with some absorbent, it acts with much advantage in the weakness and languor attending chronic hysteria.†

In diarrhœa from a want of tone in the bowels and stomach, the quassia is an excellent remedy. It has also been recommended in leucorrhœa, gout, cachexy; and Alibert says that it ought to be employed as a prophylactic, by persons who are subject to intestinal worms. It is usually given in infusion. The infusion, made in the proportion of three or four drachms of the wood to twelve ounces of water, may be taken in doses of one, two, or three table-spoonfuls.

Formulæ.

℞.—Rasuræ liq. quass. ℥ss.
Cort. aurant ʒi.
Rad. rhæi contus. ℈i.
Potassæ carbon. ʒss.
Aq. fontanæ fervid. ℥viii.—M. Macerate for ten hours, then strain, and add
Tinct. cardamom. ʒi.—M. Dose, a table-spoonful twice or thrice daily, in weakness of the digestive functions, with acidity.

℞.—Extract. quassiæ ℈ii.
Extract. aloes gr. xii.
Pulv. ipecac. ʒss.
Mucilag. g. arab. q. s.—M. Divide into thirty pills.
S. Take one three times daily. I have used this combination with much advantage in debility of the digestive organs, with torpor of the bowels.

* Barton's MS. Lectures on Mat. Med.
† Thacher's Dispensatory.

QUASSIA SIMAROUBA.—SIMAROUBA.

This species of quassia is brought from St. Domingo, Jamaica, &c., and is also found growing spontaneously in the southern parts of the United States. The bark and not the wood of this species of quassia is used in medicine. It is inodorous, and exceedingly bitter, without any perceptible astringency. It is of a tough and fibrous texture, of a pale yellowish colour, and rough on the external surface. It furnishes a very abundant watery extract, and contains a large portion of mucilage, but very little resin. It does not, like the quassia, strike a black colour with the sulphate of iron.

The simarouba has been highly spoken of as a remedy in dysentery and diarrhœa. It has been particularly recommended for its efficacy in the former of these complaints, by Pringle, Lind, Stoll, Zimmerman, Blane, Tissot, Bampfield, &c. The latter writer, in his work on scorbutic dysentery, observes: "The infusion of simarouba, or a decoction of it, has been recommended generally in the obstinate chronic stages of dysentery, (*See Blane on Diseases of Seamen, &c.*) In my practice it has shown great powers, but these were of uncertain benefit. It was too apt to produce constipation, and its painful and disordered consequences." I have myself employed it in this disease, after it had assumed a chronic form, and repeated evacuations had been premised, and the effects have frequently been very beneficial. Alibert says that this remedy has been used with much advantage at the hospital St. Louis, in diarrhœas, following scurvy and intermittent fevers. Although many, and highly respectable testimonies may be adduced in evidence of the usefulness of this remedy in dysentery, it can, most assuredly, not be a proper

remedy in the early stage of the ordinary inflammatory dysenteries of this climate. In the typhoid or malignant form of the disease, as it occasionally prevails in hot climates—and in the chronic stage of the more sthenic varieties of the disease, advantage may, no doubt, be derived from it, under judicious management. It is, indeed, probable that the simarouba will, in general, do more good than any other astringent tonic, in instances where remedies of this kind are proper, and it undoubtedly deserves particular attention in this respect. It is said to be particularly useful in the intestinal debility left by an attack of dysentery.

It has also been much recommended in dyspepsia and intermittent fevers; experience, however, has not established its efficacy in these diseases, and it is certainly inferior in this respect to several other articles of this class of remedies. In powder it is given in doses of half a drachm. The decoction, however, is the most convenient form, and it possesses all the powers of the substance.

Formulæ.

℞.—Cort. simaroub. ℥ss.
Lychen. island. ℥i.
Aq. bullientis vi. ss.; boil down to one pint; strain and add,
Tinct. nucis. moschat. ℥ss.
Syrup. zingiberis ℥ii.—M. Take two table-spoonfuls four times daily.—(*Richter.*)

℞.—Cort. simaroub. ℥ss.
Lign. campech. ℥i.
Aq. bullient. ℥x.; boil down to ℥viii.; strain, and add,
Syrup. papaver. alb. ℥i.—M. Take a table-spoonful four or five times daily.

CROTON ELEUTHERIA.—CASCARILLA.

This is a small shrubby tree, indigenous to Jamaica, Eleuthera, Carolina, Florida, and various parts of South America. There are two varieties of the bark of this shrub brought to this country. One of these varieties consists of cylindrical or rolled pieces, varying in length from half an inch and less, to three or four inches in diameter. Externally, these pieces are of a dull, whitish or grayish-white colour, while the internal surface is of a brownish colour. The other variety, "which is now most common in the United States, consists entirely of very small pieces, not more than an inch or two in length, very thin, without the white epidermis, not regularly quilled, but curved more or less, in the direction of their length, often having a small portion of woody fibre attached to the inner surface." It does not appear that these two varieties of the bark differ in any degree, in their properties and medicinal powers; and they are, probably, derived from the same species of Croton,—the difference in their appearance arising from different modes of collection, or from being taken from different parts of the shrub. The cascarilla is very bitter, and it has a strong aromatic odour, which becomes particularly manifest when burned or heated by friction. It contains a very large proportion of resin, and hence alcohol is its most appropriate menstruum. According to the analysis of Tromsdorff, it contains also, besides resin, a small portion of mucilage, a bitter principle, and a very volatile essential oil.

As a remedial article, this bark was first brought into notice in the year 1692, in a dissertation attributed to a Spaniard of the name of Vincent Garcias Salat. It soon afterwards attracted the attention of many of the

most celebrated physicians of Germany,* and was highly praised for its febrifuge powers; which, by some, were affirmed to be superior even to those of the Peruvian bark. Stahl and his followers contributed greatly to its reputation as a remedy in intermittent fevers; and Junker and Alberti spoke in the highest terms of its powers in this disease. It possesses considerable stimulant properties, and is, therefore, peculiarly adapted to cases attended with a sluggish, phlegmatic, and inirritable habit of body. It has been particularly recommended in what have been called putrid or malignant intermittents. The very strong and respectable testimony, which we have in the writings of physicians, in favour of the febrifuge virtues of the cascarilla bark, do not permit us to doubt of its usefulness in this way.

This bark is especially a valuable medicine in weakness of the stomach, attended with flatulent pains, acidity, frequent vomiting, and habitual costiveness from torpor of the bowels. Küglestein asserts, that we possess no remedy superior to this bark, in the gastric weakness accompanied with frequent nausea and vomiting, sometimes met with in hysteric and phlegmatic females. Given in combination with valerian, it will often afford speedy and complete relief in such cases.†

It has also been employed in dysentery and diarrhœa, but in neither of these complaints can it be beneficial or even proper, except in the chronic stage of the former, connected with great prostration; and in diarrhœa, depending solely on chronic irritation and relaxation of the intestinal canal. Cullen speaks very slightly of this medicine, but I am inclined to think that his estimate of its powers fall considerably short of its real merits. I have given it in chronic debility of the

* Alibert's Mat. Med.

† Richter's Arneimittell. B. i. p. 369.

digestive organs with decided advantage; and in intermittents attended with much general debility and relaxation, I have known it to prove highly beneficial, given in combination with cinchona.

It may be given in powder—in doses of from twelve to thirty grains. The tincture is an active preparation, but the decoction or infusion possesses no very active powers.

Formulæ.

℞.—Rad. cascaril. ℥ss.
Rad. valerian. ℥i.
Aq. bullient. ℥xii.; macerate for ten hours, then add,
Syrup. zingiberis ℥ii.
Tinct. cascarillæ ʒii.—M. Dose, a table-spoonful three times daily. This is an excellent combination, in gastric debility, with flatulency and general languor.

SECONDARY VEGETABLE TONICS.

PRUNUS VIRGINIANA.—WILD CHERRY.

This is a large and handsome tree, indigenous to the United States, in many parts of which it is found in considerable abundance. The bark of the tree, which is the part employed in medicine, has a bitter, astringent, and slightly aromatic taste. Its smell resembles that of those substances which contain prussic acid, particularly the peach kernel. This bark, indeed, contains a very considerable portion of the prussic acid, a circumstance upon which I am inclined to believe its remedial powers mainly depend.

When taken into the system, it produces a slight increase of the action of the heart and arteries, and induces, in some individuals, considerable drowsiness. When continued for some time, and not in very large

doses, it gives tone to the stomach, and, by this effect, vigour to the general system. When, however, it is taken in *large* quantities, and frequently repeated, it weakens the digestive organs, and produces an effect upon the action of the heart and arteries, the very reverse of a stimulant. In my own person I have several times reduced my pulse from seventy-five to fifty strokes in a minute, by copious draughts of the cold infusion, taken several times during the day, and continued for twelve or fourteen days. This effect has not, I believe, been noticed before, but from much experience with it, I am strongly inclined to believe, that we may control the action of the heart and arteries, to a considerable extent, by the use of this substance.

The wild cherry bark has been highly recommended in the cure of intermittents. I have myself employed it a good deal, while residing in the country, and in the majority of cases with success. It has appeared to me most useful in those cases in which the bark did not produce its usual beneficial effects; and in one instance, where the bark, arsenic, and mercury, had all been tried ineffectually, the patient was finally cured by the use of the wild cherry bark infusion.

In phthisis, also, this bark has been employed with decided benefit. I have prescribed it often in hectic fever, and in some instances with evident advantage. There is, indeed, no difficulty in perceiving how this bark may produce beneficial effects in cases of this kind. It is well known now, that the prussic acid, when judiciously administered, is capable of moderating, nay, even of removing, all the symptoms attending the early stage of pulmonary consumption. The testimony we have is too respectable and numerous to admit of any reasonable doubt as to its powers in this way. Now, the wild cherry tree bark contains no inconsiderable

portion of this acid, and it is obvious, therefore, by using the infusion of it, we employ a medicine which contains prussic acid, together with a bitter and an astringent principle, dissolved in a considerable portion of water. These ingredients would appear, I think, particularly calculated to produce good effects in pulmonary consumption, by at once lessening the irritability of the system, which the prussic acid does in an eminent degree, and supporting the strength of the patient by the tonic principles which it contains. I have already stated the power which this remedy possesses, when taken in very large doses, of diminishing the action of the heart and arteries, and it is, doubtless, by its controlling influence in this way, in consequence, perhaps, of the prussic acid which it contains, that its action has been found so useful in diseases attended with an irritated or hectic state of the circulation. Whether it be ever capable of giving perfect relief in phthisis, is extremely doubtful, but of this I am satisfied from repeated experience, that it is one of our most valuable palliatives, and well deserving of attention in the present disease. Its effects, indeed, upon phthisical patients, are very similar to those of the prussic acid. It frequently lessens the frequency, tension, and irritated state of the pulse; moderates the cough, and profuse nocturnal perspirations; checks the diarrhœa, and sustains the general strength of the system.

In chronic hysteria, I have, in several instances, prescribed this remedy with great relief to the patients. I have found it equally useful in wandering rheumatic pains and swellings, attended with a small, corded, and frequent pulse, and general debility of the system.

The wild cherry bark has also been recommended as a very useful remedy in asthma. Of its powers in this complaint I can say nothing from my own experience.

It is to be given during the intervals of the fits, and in large doses.

When given in moderate doses, it often produces excellent effects in dyspepsia. I have, however, found that large and frequent doses of this remedy have a tendency rather to weaken than to invigorate the digestive powers of the stomach. This I have particularly observed in my own case.

Very excellent effects are said to have been produced by washing irritable and fungous ulcers with a decoction of this bark.*

The bark of the root is stronger than that of the trunk. To certain animals the leaves of the tree are said to be poisonous. The cherries have been advantageously used as a domestic remedy in scurvy and dysentery.

The dose of the powdered bark is from ʒss. to ʒii. The decoction does not appear to possess much strength. The prussic acid, which appears to be its most important part, is driven off by boiling. The cold infusion, however, is an excellent preparation. An ounce of the bark is to be infused in a pint of cold water, for twenty-four hours. Dose, a wine-glassful every four hours.

CORNUS FLORIDA.—DOGWOOD.

This is a common and well known tree throughout the United States. It appears from the experiments of Dr. John M. Walker,† that the bark of this tree differs but very little in chemical composition from the Peruvian bark, and experience has fully demonstrated that, in their operation on the system, these two articles

* Thacher's Dispensatory.

† Inaugural Dissertation. Philadelphia, 1797.

possess a very close resemblance. In its sensible qualities, too, the dogwood bark is very much like the cinchona; it has a bitter, astringent, and slightly aromatic taste. Its astringency is, however, stronger than that of the Peruvian bark.

In the cure of intermittents, the dogwood bark has been a good deal used in some parts of this country; and from the concurrent testimony of those who have employed it, as well as from my own experience, I am persuaded that of all our indigenous tonics, this bark is the most useful in the present disease.

When employed in a recent state it is said to be apt to disagree with the stomach, and to produce pains in the bowels. To obviate this, it is only necessary to give it in conjunction with a few drops of laudanum; or to employ the bark after it has been collected for some time. Thirty-five grains of the dogwood bark is about equal to thirty of cinchona. An infusion of the flowers has been used with advantage in flatulent cholic. "A decoction of the small branches and buds agrees well with weak stomachs, and is, perhaps, the most eligible form of exhibiting this medicine."*

There are two other species of cornus; the *cornus circinata*, and *cornus sericea*, which have been introduced into the United States Pharmacopœia, fifteen feet high. The bark of the branches is covered with numerous little warty excrescences, and the leaves are large, oval pointed, and waved on the edges, with a down on the under surface, particularly along the nerves. The flowers are white, and disposed in depressed cymes. The berry is blue. When dried, the bark affords a powder resembling that of ipecacuanha in colour. Its taste is bitter, considerably astringent, and slightly aromatic. In chemical composition it does not appear

* Collections, &c.

to differ from the C. florida. It possesses, also, similar medicinal virtues, and is employed in the same doses, and in the same diseases. The *Cornus sericea* rises from about five to ten feet in height. The stem is covered with a reddish, shining bark, and the young shoots and branches are distinctly pubescent. The leaves are opposite, petiolate, ovate-lanceolate, pointed without, entire along the edges, and covered on the under surface with a conspicuous brownish pubescence. The flowers are small, white, and aggrated into terminal cymes. The berries are of a light blue colour. The bark of this species is in all respects equal to that of the C. florida. When digested in proof spirit, it produces a beautiful red tincture. The dose is the same as of the other species.

These species of cornus may be advantageously given with aromatics and other tonics. An excellent mode of prescribing them in intermittents, is in union with Virginia snake-root.

SALIX ALBA.—WHITE WILLOW.

There are three species of willow recognized in the British Pharmacopœias, as possessing useful medicinal properties, namely, the *S. alba*, *S. caprea*, and *S. fragilis*. Of these, the salix alba is the only one which has been admitted into the Pharmacopœia of the United States. This species was introduced into this country from Europe, and is now abundantly met with in the eastern and middle states. It grows from twenty to forty feet in height, "with numerous spreading branches, the younger ones of which are invested with a fine silky down. The bark of the trunk is rough, and of a yellowish-brown colour," whilst that of the young branches

is smooth, and of a greenish yellow. The leaves are alternate, with short footstalks, long-canceolate, very pointed, acutely notched along the margins, pubescent on both sides, and without stipules or leaflets at the base of the footstalks.

The bark of this species of willow has a faint aromatic odour, and a peculiar bitter and astringent taste. Water readily extracts all its active properties, and forms, by boiling, a reddish-brown decoction. According to Pelletier and Caventou's analysis, it contains tannin, resin, a yellow colouring matter, gum, and an acid. M. Leroux has recently obtained a peculiar crystallizable principle from this bark, in which the active or medicinal powers of the willow reside, and which has, therefore, received the name of *salicin*. This substance is in the form of fine white crystals, readily dissolved by water and alcohol, but wholly insoluble in ether. It has a very bitter taste, and partakes of the odour of the willow bark.*

The bark of the willow possesses excellent tonic properties, and has been particularly recommended for the cure of intermittents. I have used it in several cases of this disease with speedy and complete success. In chlorosis, too, when wholly free from febrile irritation, it is said to be peculiarly beneficial. *Salicin* has recently been recommended as an excellent substitute for the sulphate of quinia, in the cure of intermittents. Magendie states that he has found it a valuable remedy

* Messrs. Fisher and Tyson recommend the following plan for procuring the *salicin*. Boil willow bark with caustic lime in water; filter the decoction, and add sulphate of zinc until it ceases to produce a precipitate; filter the liquid again, and evaporate it to the consistence of an extract; treat this residue with alcohol. "The tincture thus obtained if carefully evaporated, yield crystals of salicin, which may be purified by washing with a saturated solution of the same principle in cold water."—*Jour. Coll. Pharm.* iii. p. 214.

in this disease, and that "he has seen three doses, of six grains each, arrest the progress of the fever." We have, also, the testimony of MM. Miguel, Huscon, Bally, Girardin, Cognon, and others, in favour of its efficacy in this and other maladies requiring remedies of this kind. In general, from twenty to thirty grains of salicin are sufficient to arrest the course of the fever.

CHIRONIA ANGULARIS.—CENTAURY.

This is a beautiful plant, and exceedingly abundant in some parts of the United States. The root, which is annual, consists of yellowish fibres; the stem is erect, from one to two feet high, herbaceous, smooth, and four-sided; the branches are opposite and auxiliary; the leaves opposite, ovate, amplexicaule, and three-nerved. The flowers, which are numerous, grow at the extremities of the branches, and are of a beautiful rose-colour above, but pale, and in many specimens nearly white in the centre underneath. The calix is much shorter than the corolla; its segments are very acute. The centre of the corolla is marked by a pentangular star, of a yellow colour, bordered with green. The petals are obovate, and sometimes nearly lanceolate.

This plant is one of the most useful and agreeable of our indigenous vegetable bitters; and is decidedly more valuable than the centaury (chironia centaurium) of Europe. It is a pure bitter, possessing a slight aromatic flavour, and by no means offensive to the stomach. Both alcohol and water extract its active principles. It does not appear to possess any astringency. In domestic practice it is much used as a stomachic for weakness of the digestive organs; and I know of no bitter which is more grateful and effectual in cases of this

kind, than this one. It has also been a good deal used in some parts of the country in intermittents. I have myself employed it in some instances, but I do not remember any case in my practice which was cured by it. I knew a country practitioner, however, who was in the habit of giving this remedy conjointly with *calamus aromaticus*, in intermittents, and with very considerable success.

It is commonly given in the form of strong infusion. Of this, from a half to a whole gill may be taken frequently during the day. The dose of the powder is from twenty to thirty grains.

There is an excellent figure of this plant in Dr. Barton's Vegetable Materia Medica of the United States, vol. ii.

LIRIODENDRON TULIPIFERA.—TULIP TREE.

This is one of the largest and most beautiful of American forest trees. It rises to the height of eighty, ninety, and even one hundred and forty feet, putting forth, about the middle of May, an abundance of superb flowers, marked with green, yellow, and red streaks, which, together with its beautiful foliage, give to the tree a very magnificent appearance. The bark, which is the part employed in medicine, is of a strongly bitter, and slightly aromatic taste. According to the analysis of Dr. Rogers,* it contains gum, resin, muriatic acid, iron, calcareous salt, mucus, and fecula. Professor Emmet of the University of Virginia has recently obtained from it a peculiar volatile principle, in which the medicinal powers appear to reside, and which has received the name of *liriodendrin*. When pure, this

* Inaugural Dissertation. Philad. 1802.

principle is solid white, crystallizable, insoluble in water, soluble in alcohol and ether, and fusible at a temperature of 180°; volatilizable and partially decomposed at 270°. It has a weak aromatic odour, and a pungent bitter taste. It does not unite with alkalies; these, on the contrary, precipitate it from the infusion or decoction of the bark "by combining with the matter which renders it soluble in water." It is, likewise, incapable of uniting with acids, and is precipitated from its alcoholic solution by water. The active properties of the bark escape, in part, by boiling. They are much weakened, and finally almost entirely dissipated by long keeping. This bark has been long employed, both in domestic and regular practice in the United States, and it appears from the testimony which has been published in favour of it, to be well entitled to the attention of the profession.

This bark possesses considerable stimulant properties, but it is chiefly on account of its tonic effects that it deserves notice. It acts also occasionally as a diuretic, and in general produces very conspicuous diaphoretic effects, when largely administered. The bark of the root appears, however, to be less stimulant and more purely tonic, than that of the trunk or smaller branches.

Given in union with dogwood, or the prinos verticillatus, it has been employed with much success in the cure of intermittents. The late Dr. Rush employed it, as he states, "with as much satisfaction as any of the common bitters of the shops."*

Dr. J. T. Young, in a letter to governor Clayton, of Delaware, says, "I have prescribed the poplar bark in a variety of cases of intermittent fever, and can declare from experience that it is equally efficacious with the

* Transactions of the College of Physicians of Philad. 1798.

Peruvian bark, if properly administered."* As this bark is, however, considerably stimulant, it should never be given where the intermission is marked by symptoms denoting a phlogistic tendency in the system. Bleeding and purging are necessary preliminaries to the employment of this remedy, where the habit is inflammatory.

It has also been much recommended in chronic rheumatism and in gout,† and from its manifest tendency to produce diaphoresis, together with its tonic operation, there can be little doubt of its occasional usefulness in affections of this kind. From these combined properties it also often acts with great advantage in the advanced stage of dysentery.‡ In this disease I have repeatedly employed it in conjunction with the ulmus aspera, in the form of decoction, and in general the effects were very satisfactory.

Dr. J. T. Young, whom I have already quoted, speaks in very high terms of this remedy in the cure of hysteria. "I can assert from experience," says he, "there is not in all the materia medica a more certain, speedy, and effectual remedy in hysteria, than the poplar bark, combined with a small quantity of laudanum."

Dr. Young also states, that he has used this bark with much advantage as an anthelmintic. "I have never known it to fail," he observes, "in a single case of worms which has come under my observation." I have given it for this purpose in several instances, without deriving any good effects from it.

In a debilitated state of the stomach, the powdered bark of this tree, in union with steel dust, has been prescribed with very great advantage.§ The bark may

* Carey's American Museum, vol. xii.
† Barton's Collections.
‡ Thacher's Dispensatory.
§ Ibid.

be given in substance, tincture, infusion, or decoction. In substance, however, it acts with most power. The dose of the powdered bark for an adult, is from thirty to one hundred and twenty grains. The tincture may be given in tea-spoonful doses. If it produces purging and griping, a few drops of laudanum should be added to it.

ANTHEMIS NOBILIS.—CHAMOMILE.

Chamomile is one of the most ancient articles of the materia medica. It was employed by the Egyptians as an external application, in the cure of fevers; and it appears from the Greek writers, that it was held in very great estimation by them.*

It does not appear that chamomile flowers have as yet been subjected to any particular analysis. They have been ascertained, however, to contain a considerable portion of bitter extract, and an essential oil of a beautiful sapphire blue, or of a greenish brown colour, resin and tannin. By being exposed to the light and air, this oil is liable to undergo changes.

Chamomile flowers were at one time much prescribed for the cure of intermittents, and much respectable testimony is extant in favour of their powers in this complaint. We are informed by Dr. Cullen that Dr. Pitcairn thought them quite equal in this respect to the Peruvian bark, and Hoffman considered them very efficacious. Cullen, also, employed them with success in this disease. He states, however, that their employment is frequently attended with the inconvenience of readily running off by stool, to obviate which he usually gave them with an opiate or some astringent.

As a stomachic bitter, chamomile flowers are much

* Paris's Pharmacologia.

employed, and their effects in this way are commonly decidedly beneficial. They are also an excellent remedy in spasmodic and flatulent colics; in hysteria, attended with habitual weakness of the digestive organs, and in restraining violent bilious vomitings. When employed for restraining vomiting, a *weak* infusion must be employed; a strong one having the property rather of exciting than of allaying vomiting. The infusion is much employed to promote the operation of emetics, but for this purpose it ought to be used strong.

Chamomile flowers are often employed in colds and catarrhs, as a gentle diaphoretic, and they, indeed, seldom fail in producing this effect. The essential oil is used as a carminative, and cordial diaphoretic. The leaves and flowers of chamomile have sometimes been used as an external discutient application; and the infusion of them is said to be very beneficial when used in the form of a clyster, in dysentery and colic. The incompatible substances are, the soluble preparations of iron, nitrate of silver, oxymuriate of mercury, acetate and subacetate of lead, solutions of isinglass, infusion of yellow Peruvian bark.

In substance these flowers may be given in the dose of a drachm or more; but they are usually prescribed in the form of an infusion. They give out their virtues both to water and rectified spirit.

MINERAL TONICS.

FERRUM.—IRON.

Among the mineral tonics, iron undoubtedly holds the first rank, whether we consider it in relation to its

general tonic effects, or the extent and variety of its remediate applications.

Cullen thought that iron is totally inactive in its metallic state, except it meet with an acid in the stomach, to corrode and render it soluble.

This idea is, however, without foundation, as it is now sufficiently ascertained that the gastric juice readily dissolves iron in its metallic state, "without the intervention or aid of the acetous, or any other acid present in the stomach."*

The effects of iron on the system are those of a slow but permanent tonic, increasing the fulness and frequency of the pulse, rendering the blood more florid, and imparting permanent vigour and tone to the general system. It is therefore obvious, that this metallic tonic is peculiarly adapted to cases of debility attended with a weak and sluggish pulse, and a pale, cold, and relaxed state of the body.

One of its earliest remediate applications was for the purpose of restraining hæmorrhages; and in these cases it may be injurious or beneficial, according to the particular state of the system attending the complaint. In what are called active hæmorrhages, this remedy can hardly fail to prove pernicious, unless some of its astringent preparations be employed. In those chronic hæmorrhages, however, which depend on a laxity of the animal fibre, and are accompanied with a pale and cachectic state of the body, iron, either in its metallic form, or in that of its milder preparations, is a remedy of unquestionable benefit. It is peculiarly advantageous in those cases of chronic uterine hæmorrhages which occur in females somewhat advanced in life, and of a relaxed and debilitated habit of the system. In cases

* Dr. Barton, in a note to Cullen's Mat. Med.

of this kind I have done much good by exhibiting small doses of iron and Peruvian bark, and interposing occasionally some active astringent, when the discharge became alarming. M. Alibert says, that he has employed this remedy with much success in the hæmorrhages which accompany scurvy.*

In general, iron is a very important remedy in all diseases attended with a feeble and cachectic state of the system. In chlorosis, it is justly considered as one of our most useful remediate means. In this affection there is a great want of tone and activity in the system; every thing indicates languor and relaxation of the vital energies. The pale and leaden hue of the countenance, the flaccidity of the skin and muscles, the swellings of the feet, the anorexia or depraved appetite, the indisposition to active exercises; all these symptoms point out the necessity of invigorating measures, and none appears to be so generally useful as iron, aided by the gentle exercise of gestation. This, however, applies only to the strictly chronic cases of the disease. In some instances of chlorosis, there exists a considerable degree of febrile irritation, or so strong a tendency to pyrexial excitement, that tonics of every kind are wholly out of the question. Instances of this acute character must be managed by mild aperients, pure air, gentle exercise by gestation, and a mild but nourishing diet.

Iron is also much prescribed as an emmenagogue; and it is, in fact, often the most effectual remedy we can employ. It must be observed, however, that it is only in those cases of amenorrhœa which are attended with great debility and relaxation, that it can be employed with advantage. Where the complaint is attended with an opposite state of the system, this remedy

* Alibert, Elemens de Therapeutique, tom i. p. 180.

is not only useless, but absolutely pernicious. The emmenagogue effects of iron depend on its general tonic powers; and it is only in proportion as its general roborant effects are produced, that it acts beneficially in restoring the suppressed menses in cases of this kind.

Iron has been highly recommended in scrofulous affections. Alibert says, "there are few remedies more useful in scrofulous complaints than iron;"* other practitioners have added their testimony in favour of its remediate powers in affections of this kind.

Of late it has also been particularly recommended in the cure of cancerous ulcerations. Dr. Carmichael, of Dublin, has written a work† expressly on the use of iron in the cure of cancerous affections. Respectable as is the testimony of Dr. Carmichael, more extensive and diversified experience is still wanting before we can pronounce on the real value of this practice. It is not, however, just to oppose speculative doubts to the facts of direct experiment; and we have, therefore, no right to invalidate the large body of evidence offered by Dr. Carmichael in favour of this remedy in cancer, until ample and diversified experience shall have shown it to be inefficacious. Dr. C. recommends the iron to be given in very large doses, and to be continued for a long time; the ulcers are to be sprinkled with the powdered carbonate of this metal, or touched with the muriated tincture.

In atony of the stomach and bowels, chalybeates are often exceedingly useful when given in combination with bitters. This remedy has also been recommended in dropsy. Sydenham proposed its employment in the

* Elemens de Therapeutique, &c., tom. i. p. 181.

† An Essay on the Effects of the Carbonate and other Preparations of Iron in Cancer. 1809.

commencement of this disease, on the supposition that it depends essentially on a weak and watery state of the blood. "Steel," he says, "is the chief corroborative in the beginning of dropsy, for it heats and invigorates the blood." It is, however, well known now, that this disease is very generally connected with a phlogistic condition of the system, and where this is the case the use of iron is obviously improper. In anasarcous swellings, from general debility, we may readily conceive that this remedy may produce excellent effects. Alibert* mentions the case of a weak and delicate female, labouring under anasarca, who was constantly much relieved by the black oxide of iron; and Dr. Robert Archer has reported a case of general dropsy, in a soldier, which was effectually cured by the black sulphuret of iron.†

Mr. Halle describes a singular affection under the name of *anæmia*, (privation of blood,) which, in the year 1804, attacked all the workmen in a mine of *anthracite*, near Valenciennes, and which is represented as offering symptoms very analogous to those of chlorosis. In this malady he administered iron filings, in combination with Peruvian bark, with the happiest effects. Other physicians employed iron with equal success in this disease. M. Leblen, physician of the hospital at Dunkirk, to which some of the sick were taken, administered the red oxide of iron with perfect success.‡

In another place I shall speak of the anthelmintic powers of this remedy.

The filings of iron may be taken from twenty grains to a drachm. It is generally joined with some aromatic

* Elemens de Therapeutique, tom. i. p. 180.

† American Medical Recorder, vol. ii.

‡ Bibliotheque Medicale, tom. vi. p. 195 et 342, et tom. viii. p. 297. Vide Traité de Mat. Med. par. C. J. A. Schwilgue, tom. i. p. 310.

substance, and may be very conveniently given in the form of an electuary. Care should be taken that the filings be well purified by a magnet, as they are apt, when procured from work-shops, to be mixed with the filings of other metals, particularly copper. "For pharmaceutical purposes, iron wire should be preferred, as being the most pure, since the softest iron only can be drawn; and Mr. Phillips has shown us, in experiments upon the "*ferrum tartarizatum*," that soft iron is more easily acted on by tartar."*

The preparations of this metal are very various; of these I shall, however, mention only such as are considered the most important, and fully capable of affording all the advantages which can be derived from chalybeate remedies.

Ferri subcarbonas.—Carbonate of iron.—Rubigo ferri.—This is a dark brown powder, destitute of odour, and has a slightly styptic taste. It consists of a mixture of peroxide, protoxide, and subcarbonate of protoxide of iron, in proportions subject to variation, according to the temperature at which the preparation is made. Acids act upon it, and dissolve it with effervescence; in water, however, it is wholly insoluble.

This is, perhaps, the best preparation of iron in the majority of cases for which martial remedies may be thought necessary. It is by no means unpleasant to take, and sits easily on the stomach. In certain cases, however, where a costive habit of body exists, this preparation is apt to increase the confined state of the bowels, and when this is the case, we ought to employ the filings instead of the rust.

The carbonate of iron has lately been recommended as a very efficacious medicine in tic douloureux. Mr. B. Hutchinson has published a pamphlet in which he

* Paris's Pharmacologia.

adduces many examples of the efficacy of this remedy in this disease. Mr. Richmond, also, has lately reported a case which was promptly relieved by the carbonate of iron, after a great variety of remedies had been ineffectually tried. He prescribed it in drachm doses three times a day.*

It may be given in the form of pills, or powder, combined with aromatics, in doses of from gr. vi. to lx.

Ferri sulphas.—Green vitriol.—Copperas.—The sulphate of iron consists of green-coloured, transparent, rhomboidal crystals. When exposed to the air they effloresce, and when subjected to a high temperature, they are deprived of their acid, leaving a peroxide of iron, which constitutes the *colcothar* of vitriol. The sulphate of iron dissolves in two parts of water at 60°, and in three-fourths at 212°. In alcohol it is insoluble, unless the iron be further oxidized, when it undergoes solution in this menstruum.†

This preparation possesses all the powers of iron, and may be employed with advantage where chalybeates are indicated. Its employment, however, requires much more caution than the preceding preparation; for in large doses it is apt to produce pains in the stomach and bowels, and may excite very alarming symptoms. It has of late years been strongly recommended in cases attended with chronic irritation, or inflammation of the mucous membrane of the alimentary canal. Abercrombie and Armstrong give it in doses of from one to two grains, with five or six grains of aromatic powder, several times daily. I have employed this preparation in cases of this kind with decided advantage, but seldom in larger doses than one grain.

Besides its tonic properties, it is also powerfully as-

* Med and Phys. Journal, No. cclxxi. p. 271, for Sept. 1821.

† Paris's Pharmacologia.

tringent, and answers very well in solution as a wash for indolent and fungous ulcers. It is also a good application to herpetic eruptions.

It is given in the dose of gr. i. to v. in combination with rhubarb, aromatic powder, myrrh, &c.

The incompatible substances are, "salts whose base forms an insoluble compound with sulphuric acid; the earths, the alkalies, and their carbonates; borate of soda, nitrate of potass, muriate of ammonia, tartrate of potass and soda, acetate of ammonia, nitrate of silver, subacetate and acetate of lead, and soaps."

Ferrum ammoniatum.—Flores martialis.—This salt is obtained in the form of small granular crystals, which deliquesce on being exposed to the air. It is of an orange yellow colour, of a styptic taste, and of an odour similar to that of saffron. The chemical composition of this salt appears to vary considerably with regard to the proportion of the substances that enter into it, according "to the degree of heat and time employed for its preparation." It would appear to consist of submuriate of ammonia and submuriate of iron, with the iron in a state of red oxide. Four drachms of this substance are dissolved in one ounce of water. Alcohol dissolves it readily.*

This preparation possesses the tonic virtues common to the other martial remedies. In some instances, however, where we wish to avoid constipation, it is preferable to the rust; for although it does not act sensibly as an aperient, it has no constringent powers, and, therefore, does not interfere with the regular action of the bowels, as is sometimes the case with the rust.

The dose is from two to ten or twelve grains, in the form of a bolus.

Ferrum tartarizatum.—This preparation consists of

* Paris's Pharmacologia.

brownish green-coloured powder, having no odour, and a taste slightly styptic. It dissolves with great ease in water, the solution remaining a long time without undergoing any changes.*

This is an excellent preparation of iron. A watery solution of it is recommended by Dr. Bateman as a chalybeate peculiarly suited, from its tasteless quality, to the palates of children, and as being more efficacious than the vinum ferri. Its qualities have also been particularly commended in a communication from Dr. Birbeck, published in the London Medical Review.†

The incompatible substances are, "a strong acid, lime-water, hydro-sulphuret of potass, astringent vegetables. The fixed alkalies and their carbonates decompose the solution very slowly, unless heated; but ammonia and its subcarbonate produce upon it no effect, whether it be hot or cold." Dose, from gr. x. to ʒss.

Phosphas ferri.—Phosphate of Iron.—The phosphate of iron is a preparation, which, like the preceding one, has been but lately introduced as a remediate article. It consists of a powder, either of a blue or yellow colour, according to the mode in which it is prepared. It has no odour, and little or no taste. The blue phosphate is considerably stronger than the yellow. The latter may be given in doses of from twenty to sixty grains, three or four times a day; but the former cannot be administered beyond eight or ten grains, without being apt to excite nausea and vomiting.

The phosphate of iron is considered by those who have employed it an excellent chalybeate. It is said to be particularly serviceable in amenorrhœa, attended with weak digestive power. It has also been administered with very favourable results in obstinate cutaneous

* Paris's Pharmacologia.

† No. xix. July, 1819.

eruptions, chronic rheumatism, and scrofula. This is the preparation chiefly recommended by Dr. Carmichael for the cure of cancer.

Ferro Ferrocyanas.—Ferrocyanate of Iron.—Prussiate of Iron.—This preparation of iron has been lately employed with much success in the treatment of intermittent fevers. Dr. Zollickoffer of Baltimore was the first who noticed its powers in this way. He relates a number of cases in which it was successfully used.* He gave it in doses of from four to six grains every four hours. I have known this remedy to be employed with considerable success by several practitioners of this city. I have prescribed it in five or six cases, in three of which it removed the disease very promptly. In cases of children, it is a very convenient medicine, being destitute of taste or smell, and the dose forming but a very small bulk.

The prussiate of iron has also been strongly recommended in passive menorrhagiæ. In the menorrhagiæ which occur in weak, relaxed and irritable females, about the final cessation of the menses, this article is, indeed, to be accounted among our most useful remedies. In a chloratic state of the system, attended with torpor of the bowels, and obstruction of the catamenia, I have employed a combination of this preparation and aloes with peculiar advantage. Three grains of the ferrocyanate of iron, with a grain of aloes, forms a proper dose. It should be taken three times daily, continued for several weeks. In general, this is decidedly the best ferruginous tonic, where, along with debility and relaxation, there is great irritability of the nervous and sanguiferous systems. The prussic acid which enters into its composition would seem to be separated by the action

* American Medical Recorder, vol. v. p. 540.

of the stomach, and to exert its peculiar sedative powers on the nervous system.

CUPRUM.—COPPER.

Copper has a slightly styptic taste, and a peculiar, faint, nauseous smell. It is said by some writers that this metal is perfectly inert when received into the stomach in its metallic state. Mr. Drouard convinced himself of its innocence by administering the filings to dogs; in no instance did it produce any injurious consequences. Indeed, we often see children who have swallowed copper coins without any perceptible effects on the system. In cases where it has proved deleterious, an acid probably existed in the stomach, by which the metal was converted into a soluble salt, and thus rendered active. Others, however, assert that it is poisonous in its metallic state. It is said to be acted on by the gastric liquor, and rendered active. This may be the case; but it is extremely probable that the copper is not dissolved in its metallic state, but in that of an oxide, to which it is previously converted by the fluids in the stomach.*

In its metallic state copper was formerly employed as a remedy in rheumatism; and Cothenius recommends its filings in the cure of hydrophobia. At present it is,

* Dr. Paris mentions a striking instance in proof of the inertness of copper when taken into the system in its metallic state. "A young woman," says he, "swallowed six copper penny pieces with a view of destroying herself; she was attended by Dr. Maton and myself, in the Westminster hospital, for two years, for a disease which we considered visceral, but which was evidently the effects of *mechanical* obstruction occasioned by the coin. After a lapse of five years she voided them, and then confessed the cause of her protracted disease, during the whole course of which no symptom arose which could in any way be attributed to the poisonous influence of copper.

I believe, never prescribed in the metallic state. It is susceptible of a variety of chemical preparations, some of which are remedies of undoubted utility.

Copper does not, however, manifest any particular tendency to invigorate the muscular system ; and still less, perhaps, to increase the activity of the digestive organs. It is upon the nervous system especially that its tonic influence is exerted; and it is chiefly in diseases depending on a weakness or morbid irritability of this system that its remedial powers are manifested.

Cupri sulphas.—Blue vitriol.—Having already noticed this article as an emetic, I shall here speak only of its remediate powers as a tonic and alterative. As such it has been particularly recommended in the cure of intermittents, by Dr. Donald Monro and others. Richter avers that he has succeeded in curing intermittents with this article given in combination, after all the other remedies, usually relied on in this disease, had been ineffectually employed. We have also the authority of Fr. Hoffmann, (Med. Ration. et System. tom. ii. cap. viii. p. 290); Adair, (Duncan's Med. Commentar. vol. ix.); and Hahneman, in favour of the excellence of this article as a remedy in intermittents. Hoffmann (Hufeland's Journal) speaks in the highest terms of the usefulness of the sulphate of copper in bronchitis and tracheitis, or croup. He asserts that when given in doses varying from a quarter to half a grain every two hours, according to the age of the patient, in the commencement of the complaint, it often produces the happiest effect. He declares that he has often succeeded in curing well-marked cases of tracheitis by this remedy alone, without any depletion whatever (Harless, Rhein. Jahrb. b. ii.). Nyborg confirms the experience of Hoffmann in relation to the efficacy of this remedy in bronchial inflammation (Hufeland's Jour. b. 57); and

other German writers have published statements of a similar tenor.

Dropsy also is said to have yielded to the powers of this remedy. Gardane, (Med. and Philos. Comment. vol. iii.), Chalmers Wright, (Lond. Med. Jour. 118), speak well of its powers in hydropic affections connected with great relaxation and debility. Wright gave half a grain of this preparation, with the same quantity of opium, gradually increasing the dose of the former to one grain, twice daily. In scrofulous phthisis pulmonalis, the sulphate of copper has been highly praised by many writers. Curri, Senter, Simmons, Adair, and Jahn, have published accounts tending to show its usefulness in this affection. Jahn says, he has known great benefit derived in this disease, from a combination consisting of one drachm of sulphat of copper, the same quantity of powdered cinnamon, two drachms of the extract of cicuta, and two grains of opium, divided into two grain pills; of which four are to be taken three times daily. In the cure of epilepsy, this remedy was, at one time, a good deal prescribed. Dr. Cullen, before he became acquainted with the cuprum ammoniacum, gave it in this disease and in hysteria, and he states that its effects were often highly beneficial. This salt has also been commended for its effects in resolving scrofulous swellings. Dr. Parsons speaks highly of it in this respect. Chalmers prescribed it with success in colica pictonum. He gave a wine-glassful every hour of a solution of twenty grains of blue vitriol in a pint of water, until vomiting was produced. This is to be repeated until the disease disappears. Violent vomiting and purging generally ensue during the first forty-eight hours; but these effects gradually subside along with the symptoms of the disease. Blood-letting is to be employed along with the vitriol, if fever attends the

disease. Adair gave it with advantage in other varieties of colic and in dysentery. In chronic diarrhœa, depending on ulceration of the mucous membrane of the bowels, this article has of late been strongly recommended by several English writers; and my own experience enables me to speak, very favourably, of its powers in this affection. Half a grain in the form of a pill is to be given three times daily, and the dose afterwards gradually increased to two, or even three grains. It should be given in combination with opium. Dr. Elliotson has published some observations illustrative of the good effects of this article in this disease. (Med. Chir. Trans. vol. xiii. p. 2, 1827.) As an external application to chancre, and other venereal ulcérations, it often produces excellent effects. For this purpose it is best employed in solution, in the proportion of about five grains to one ounce of water. When we wish to use it for the purpose of destroying the surface of the chancre, it may be applied in substance, like caustic. It also forms an excellent injection for gleety and leucorrhœal discharges. Dr. J. Foot, of London, in his late works on the venereal disease, recommends, in the strongest terms, the following injections in gonorrhœa, after the inflammation has been reduced. Dissolve blue vitriol in a sufficient quantity of water, precipitate the solution with lixivium of tartar. Suffer it to separate, then pour off the clear liquor; wash the precipitate until it becomes insipid; make a saturated aqueous solution of sal. volat. amon.; mix as much of this precipitate with the filtered solution of the volatile salt as it will dissolve, which reserve for use. Mix of this six drops to every ounce of water for an injection.

In the apthous ulcerations which occur on the inside of the lips and cheeks, a solution of the sulphate of copper is one of the most efficacious applications. A

solution of from ten to fifteen grains of the vitriol in eight ounces of water, with a few ounces of honey, may be employed for this purpose. In that terrible affection of the gums and cheeks which occurs in children—namely, *cancrum oris infantum*, Dr. Coates, of this city, found a mixture composed of two drachms of sulphate of copper, one ounce of powdered cinchona, and four ounces of water, applied to the ulcer twice daily, more beneficial than any other application. In a case which recently came under my care, I employed this mixture with the happiest effect. Raemacher, (Hufeland's Journal, B. 62, p. 104,) asserts, that a saturated solution of the sulphate of copper in whiskey, is one of the best means we possess for promoting the growth of hair. The scalp is to be washed with it twice daily.

Cuprum Ammoniacum.—Ammoniated Copper.—This preparation consists of a triple salt; a subsulphate of the oxide of copper and ammonia. It has a metalline and exceedingly styptic taste, and an ammoniacal odour. It is soluble in the proportion of one scruple to an ounce of water.

This is one of the most powerful and valuable preparations of copper. Its powers are more strongly exerted on the nervous system than those of any of the other preparations of this metal, and it has accordingly been much employed in nervous and convulsive affections. When given in very large doses it is apt to cause vertigo, nausea, indistinctness of vision, vomiting, pains in the bowels, obstinate constipation or diarrhœa; and when its use is long continued, it may give rise to paralysis, hectic fever, violent spasmodic pains in the abdomen, spasms of the muscles, and even death. These violent effects, however, never follow its use, unless employed in very full doses; for, under cautious man-

agement, it may be given with as little risk of injury as any of the other more powerful metallic tonics.

In no disease, perhaps, has this preparation been more celebrated as a remedy than in epilepsy. It was a favourite remedy in this disease with Dr. Cullen, and many of the most eminent physicians have published statements illustrative of its good effects in this malady. Among the writers who speak particularly in praise of its powers in epilepsy, we may mention Loebenstein-Loebel, Burserius, (Institut. Pract. vol. iii.); Greding, Michaelis, (Med. Pr. Bibl. 1785, B. i.); Stark, Van Hoven; J. Frank, (Prax. Med. Univ. Prac. p. ii. vol. i.); and Richter, (Spec. Therap. B. vii.). Dr. Batt has more recently published an account of its valuable powers in this disease. He administered it in combination with valerian, to three individuals affected with epilepsy, and all were effectually cured by it. Hufeland asserts that he cured a case of inveterate epilepsy, after a great variety of remedies had been ineffectually employed, by the use of a mixture composed of one-fourth of a grain of cuprum ammoniacum, three grains of the oxide of zinc, and one scruple of powdered valerian, taken mornings and evenings, at the same time that the patient took a strong infusion of the flowers of arnica, valerian, and orange-leaves, during the day.

This article has also been recommended in other forms of spasmodic and nervous diseases; particularly in chorea, catalepsy, and in spasmodic asthma. Odier asserts, that its powers in diseases of this kind are much increased by uniting it with the oxide of zinc. B. Bell gave it with complete success in a case of spasmodic cough, attended with great irritability of the nervous system; and Walker* states, that he cured

* A Treatise on Nervous Diseases.

many cases of chorea with this remedy. He observes that he found it particularly useful where the disease was accompanied with much relaxation and debility. Willan, also, cured a case of chorea with this medicine.

In hysteric affections, attended with great irritability, anxiety, cramps, and feebleness, the cuprum ammoniacum is a remedy of very useful powers.

Thuessink, a German physician, has published some very interesting observations on the powers of this remedy in hysteria. He considers it particularly useful in those chronic cases which depend, or at least are accompanied with debility and relaxation, and a very irritable state of the system.*

I have myself employed this remedy in a considerable number of instances in chronic hysteria, and occasionally with the happiest effect. I have usually given it in combination with valerian, in the proportion of a quarter of a grain of the ammoniated copper with thirty grains of the valerian, twice daily. Particular attention, however, should at the same time be paid to the state of the bowels. If costiveness follows the use of this remedy, a mild laxative must be given from time to time, so as to keep up regular alvine evacuations. With regard to the powers of this preparation in epilepsy and similar affections, however, my own experience does not furnish me with any evidence of its particular usefulness, although I have employed it in no small number of cases of this kind. Recently I prescribed it in an anomalous spasmodic affection, resembling in some respects catalepsy, with manifest advantage; but in this instance it was employed in conjunction with the oxide of zinc.

In the cure of obstinate intermittents, this remedy is highly spoken of by Brera; he thinks it quite equal to

* Samlung. Auserles. Abhandlung für Pract. Aerzte, vol. xvii. p. 266.

arsenic in this disease, especially where there is much irritability of the general system, and the intestinal canal is in a state of debility.*

A solution of this preparation is an excellent application to old and ill-conditioned ulcers, and has also been applied with much advantage to the removal of opacity of the cornea.

We may commence with it in the dose of a quarter of a grain twice a day, gradually increasing the quantity as far as the stomach will bear it. It is best given in the form of pills. It is sometimes given with sugar; but if it be true that this vegetable substance counteracts the operation of copper, such a combination would appear to be improper.

In general, the addition of a small dose of opium will be found useful to obviate its unpleasant effects on the stomach and bowels; and this combination is especially proper where there is much gastric and general irritability present. Boerhaave, Cullen, and Richter, indeed, assert that opium enhances its powers as a remedy in spasmodic affections, independent of its mere tendency to enable the stomach to retain it with less inconvenience.

Boerhaave mentions a preparation made by digesting one drachm of copper filings in an ounce of aqua ammonia, which he represents as a very valuable diuretic, and as especially useful in some varieties of dropsy. The dose is three drops, gradually increased to twenty-four, every morning.

Liquor cupri ammoniato-muriatici.—This preparation was first mentioned by Kochlin (Med. Chir. Zeitung, 1818), and appears to have, of late years, been a good deal employed by the German physicians. It is thus

* Burdach's *Arzneimittellehre*, B. ii. p. 184.

prepared:—Digest one drachm of copper filings in an ounce and a half of aq. ammonia nine or ten days; then saturate this tincture with muriatic acid. Two drachms of this saturated tincture are to be mixed with twenty ounces of distilled water. Of this, adults are to take a table-spoonful three times daily.* This preparation is said to be peculiarly valuable as a remedy in syphilitic ulcerations, as well as in scrofulous and other obstinate or corroding ulcers. It is asserted by some writers that, in males, this tincture has the effect of exciting the venereal propensity to a very considerable degree. The writers who speak particularly in praise of this preparation in syphilitic and scrofulous affections, besides Kochlin, are, Kopp (Beobacht. in Gebiete der Prack. Heilk. p. 330); Henn (Hufeland's Journal, Bd. 58); Schneider (Med. Prakt. Adversar. &c. 1822); Wolfe (Grafe and Walther's Journal, 1825); Jager (Harless, Rheim. Jarhrb. B. 5.)

Acetas cupri.—Ærugo æris.—Verdigris.—This preparation was formerly a good deal employed as an *internal* remedy in certain chronic diseases, particularly in syphilis, scrofulous ulcerations, and other varieties of external ulcerative affections. At present, however, it appears to be entirely laid aside as an internal remedy. The celebrated nostrum of Gerbier consisted of a combination of verdigris, roasted barley, and calomel,

* Gölis recommends the following mode for preparing this tincture:

℞.—Cupr. ammoniac. ℥ss.

Solve in aqua fontanæ ℥iv.

Adde, acid. muriat. q. s. ut post coagulum viride liquor. fiat pellucidus.

Mr. Buchner's method of preparing it is as follows:

℞.—Cupri oxydati carbon. gr. xlii.

Solve in acidi muriat. s. q. donec omnis effervescentia desiderit; adde, ammonii muriat. dep. ℥ixss. Cum gr. vi. Aq. distill. q. s. ui fiat liquor. ℥vi. Gölis's preparation is three times as strong as that of Köchlin.

formed into pills. These pills are said to be highly beneficial in scrofulous and cancerous affections. The French Academy of Medicine commissioned Solier de la Romilias to test the usefulness of this remedy in one of the Parisian hospitals; and his report states that, in general, its beneficial influence upon scrofulous or carcinomatous ulcerations of the mammæ were very considerable. He found it especially useful in *noli me tangere* of the nose. The verdigris is given in doses of an eighth of a grain three times daily, and gradually increased until it begins to give rise to nausea and other unpleasant sensations in the stomach. (Dict. des Scien. Med. t. vii. p. 576.)

Schlegel (Material f. d. Staats Arneiw. 1809, 8te. Samml. No. II.) has published a series of cases tending to illustrate the good effects of verdigris in syphilitic affections. He gave it in the following way:*

Externally, the acetate of copper is still frequently employed in certain cutaneous affections and ulcerations. Dr. Good recommends the following ointment as peculiarly efficacious in *porrigo* circinata.† Swediaur asserts that a saturated solution of verdigris in aqua ammonia, in the proportion of one drop to an ounce of water, forms one of the most effectual injections, for the cure of gleet, we possess. I have myself frequently employed this injection, and usually with complete success. It is much too active, however, for the acute

* ℞.—Ærugo æris crystall.	gr. ii.
* Solve exacte in aceti concentr.	℈ii.
Admisce camph.	gr. iv.
Opii	gr. ii.
Sacch. alb.	ʒss.
Micæ panis	q. s. ut fiant pil. No. 40.

Take from five to ten, every morning, noon, and evening.

† ℞.—Cerat. resinæ ʒi. in balneo aquosa liquifactæ, adde, terebinth. vulgar. ʒss. tunc. cupri. acetas, calomel āā. ʒi. insperge, et omnia misce.

stage of gonorrhœa. The *unguentum æruginis*, or *mel ægyptiacum*, as it was formerly called, forms an excellent application in foul, indolent, and chronic ulcerations, particularly where the granulations are luxurious and spongy. In ulcerations of the gums, internal surface of the cheeks, tonsils, and fauces, this preparation is said to be especially beneficial. It may be applied to the ulcers by means of a fine pencil. There are various formulæ for preparing the *mel ægyptiacum;* but that given in the London Pharmacopœia appears to me the best. Swediaur recommends a liniment made of verdigris, composed of four grains of this preparation rubbed up with an ounce of sweet oil, as a very valuable application to atonic and callous chancres and venereal ulcerations with indurated edges, and weak and spongy granulations.

A preparation of verdigris is mentioned by Hufeland, under the name of *æther cuprius*, which he represents as a peculiarly useful remedy in spasmodic and convulsive nervous affections. It is made according to the following formulæ.* The dose of this preparation is from three to ten drops three times daily. (Richter's Arzneimittell. Bd. iv. p. 486.)

The *aqua viridis Hartmanni*, is another preparation of this article which was formerly much used as an external application to foul, indolent, or fungous ulcerations. Baldinger asserts that it generally does a great deal of good when applied to the painful ulcerative inflammation which occurs at the roots of the nails, and causes their separation. (N. Magazin. f. Aerzte. Bd. iii.) This preparation consists of a mixture of two drachms

* Æruginis. ʒi. solve in acidi. muriat. q. s. adde: Acidi. nitrici. sext. partem acidi. muriatici. Solutio ad siccitatem evaporetur, tum seponatur, donec attracto humido et ære liquescat. Liquamen solve in triplo ætheris sulphurici.

of verdigris, the same quantity of alum, half an ounce of honey, and one pint of white French wine.

ZINC.

Oxide of Zinc.—Flowers of Zinc.—The prepared oxide of zinc, consists of an inodorous, tasteless, white powder, insoluble in water, alcohol, and the solutions of the carbonated fixed alkalies, but readily dissolved by acids, and when recently prepared and still moist, in the caustic fixed alkalies, and both in pure and carbonated ammonia. Heat neither volatilizes nor decomposes it, and fuses with great difficulty. "It is sometimes adulterated with white lead or chalk. If it contains either, it will not be entirely soluble in dilute sulphuric acid, but an insoluble sulphate of lead or of lime will remain behind." Its neutral solutions in acids, when perfectly pure, form a white precipitate with the ferro-cyanate of potassa, and with sulphuretted hydrogen.

This preparation was first introduced to the notice of the profession by Gaubius (*Adversaria Varii Argument*). He obtained his knowledge of its remediate powers from a celebrated quack, who employed it with much success, as a nostrum, under the name of *luna fixata*. Since that time it has been much used in certain nervous and spasmodic affections, and its usefulness, in diseases of this kind, is attested by the general experience of the profession. As a general tonic, in relation to the muscular system and the digestive organs, it possesses but feeble powers. Its operation appears to be chiefly directed and confined to the nervous system; manifesting decided antispasmodic and roborant powers, with regard to this system.

In small or ordinary doses, the oxide of zinc produces

no immediate perceptible effect on the system. When given in very large portions, however, its action is often violent, giving rise to vomiting, spasms of the stomach, constipation or diarrhœa, inflammation of the bowels, convulsions, and paralysis. Nevertheless, it rarely produces such violent effects, unless it be taken in enormous portions, and there is, therefore, nothing to be apprehended from its regular and proper administration. Gaubius, who first employed it in regular practice, gave it in epilepsy; and the records of medicine, since his time, contain numerous statements illustrative of its valuable powers in this affection. Goodsir, Percival, Home, Bell, Osiander, Rush, Barcet,* Crell, Hufeland, and other physicians, have reported cases, demonstrating the powers of this medicine in epilepsy. Hufeland gave it in combination with cuprum ammoniacum, extract of hyoscyamus, and valerian. It appears to be more particularly useful in this disease when it affects children. Burdach observes, that it probably does more good in children by neutralizing acid in the stomach, and destroying worms.

In a case of this disease in a child, I gave this remedy in large and frequent doses, and in the course of two months succeeded in putting a permanent stop to the disease. Dr. Rush states that he cured a case of ten years standing with the flowers of zinc. When prescribed for affections of this kind, it should be given in as large doses as the stomach will bear. Commencing with a grain three times daily, the dose may be gradually increased to twenty or even thirty grains thrice a day, in adults. In general, the quantity prescribed at a dose is much too small to procure any permanent advantage in such affections.

* Mémoires sur les Causes des Convulsions chez les Enfans, &c. Paris, 1827.

Shearman (Lond. Med. and Phys. Jour. Sept. 1822) gave it in scruple doses, twice daily, and gradually increased, in some instances, to one drachm. The medicine was "thus given for four days; an active purge was then administered, and on the following day the use of the zinc was resumed as before. By this mode of employing the oxide of zinc, he declares that he has, in a considerable number of instances, succeeded in curing epilepsy.

It has also been employed against hooping-cough, Hagen and Loeffler recommend it highly in this singular disease.

The flowers of zinc are a remedy of considerable value, in hysteric affections, connected with much relaxation and weakness. In cases of this kind I have sometimes employed it with Peruvian bark, and in several instances with very considerable advantage. Within the last two years, I have in several instances of chronic hysteria, employed the oxide of zinc in union with castor, or the tincture of belladonna, with the happiest effect. Two grains of zinc, with five grains of castor made into pills, or with twenty-five or thirty drops of the T. belladonna may be taken thrice daily.

This remedy has likewise been employed with very good effects in spasmodic diseases arising from the suppression of chronic cutaneous eruptions. Robœl used it in children affected with symptoms of chorea in consequence of the suppression of eruptions on the head, and he states that the result was entirely favourable; the eruption returned after using the remedy for some days, and the disease disappeared.*

Its powers as a remedy in chorea, have, indeed, been much extolled by many writers of great authority. Bur-

* Burdach's Arzneimittellehre, B. ii. p. 197.

serius (Institut. vol. iii.), Van Hoven (Handbuch, Bd. ii. cap. 14), Hufeland (Journal, B. xxvi. st. iii. p. 74), Richter (Med. Chir. Observat. p. 105), Alexander (Duncan's Annals, 1801, p. 303), Thilenius (Med. Chir. Bemerk. Bd. i.), Wright (Memoirs of the Med. Society of Lond.), Brent, and many other celebrated physicians, have reported cases of this disease, which yielded to the oxide of zinc, after various other remedies had been ineffectually used.

This preparation has also been successfully employed in spasmodic asthma. Wolff has related a remarkable case, which yielded completely to this remedy (Hufeland's Jour. Bd. xviii. st. i. p. 53), and Jahn (Mat. Med. Bd. ii.), asserts that he has often derived great benefit from its employment in affections of this kind.

According to the experience of Hufeland, the oxide of zinc is a remedy of great value in the eruptive stage of small-pox, when the eruption is slow and imperfect in its progress, or is interrupted before it is fully completed, and attended with nervous or convulsive symptoms. He says that in such cases this medicine allays the muscular twitching, delirium, and febrile irritation, and often speedily improves every symptom of the disease. To children of from one to three years old, he gave two grains of the oxide every two hours. Sprengle also speaks very favourably of this practice, and observes that he found it especially useful to promote the regular suppuration of the pustules, where this process went on imperfectly. Thuessink (Hufeland's Jour. Bd. vi. p. 672) employed this article with marked benefit in an epidemic small-pox, attended with prominent catarrhal symptoms. Hufeland states, that in some instances where violent symptoms ensued the retrocession of measles, he has derived great advantage from

the free employment of this remedy; and Richter expresses a favourable opinion of its powers in cases of this kind.*

Externally, the oxide of zinc admits of various useful applications. Hufeland recommends an ointment made by mixing half a drachm of the oxide of zinc with an ounce of spermaceti ointment, as peculiarly beneficial in painful excoriations and ulcers of the nipples. It is also one of the most effectual applications we possess in obstinate *herpetic* ulcerations, and in other eruptions of a scabby and ulcerative character. Greiner (Richter, Spec. Arzneimitt.) asserts that we possess no remedy superior to this ointment in ulcerations of this kind. He succeeded in curing an ulcer on the nose simply by the application of this ointment, after it had for eight years resisted various modes of treatment. Bateman mentions it as an excellent application in *porrigo furfurans*. In herpes of every variety it will often do much good. Wetzler states that he cured cases of this kind after various other approved remedies had been ineffectually employed. Crusta lactea also has been successfully treated by this ointment; and Thuessink states that he has derived great benefit from the application of the oxide of zinc,† mixed with powdered starch, in erysipelatous inflammation. Somme (Archives Generales de Med. t. i. 1823) strongly recommends injections composed of half an ounce of this preparation and two pints of water in *fluor albus*. He declares that he has succeeded in putting a permanent stop to the disease by

* Specielle Arzneimittellehre, B. iv. p. 508.

† "Dr. Roloff, of Magdeburg, has lately discovered the casual presence of arsenic in the oxide of zinc; by boiling the substance in distilled water and assaying the solution with ammoniaco-nitrate of silver, its presence may be instantly recognised; chalk may be detected by sulphuric acid, exciting an effervescence; and white lead, by forming an insoluble sulphate of lead. It ought to be volatile."—*Paris's Pharmacologia.*

this remedy in the course of three or four days. In ophthalmia, the oxide of zinc in the form of an ointment has been much used. Plenk recommends a lotion consisting of a drachm of this preparation and six ounces of water; or an ointment made by mixing one scruple of it with an ounce of fresh unsalted butter, applied to the edges of the eyelids. In pruriginous ophthalmia, an ointment composed of half a drachm of the zinc, one ounce of lard, and four grains of opium, will often procure speedy relief.

Sulphas zinci.—White vitriol.—The sulphate of zinc is a remedy of very considerable powers, and has been much employed in spasmodic and other diseases. Under the head of Emetics, I have already spoken of the remediate application of this substance, so far as its emetic properties are concerned, and it remains for me, therefore, in this place, only to notice its virtues as a tonic.

In the cure of epilepsy, many practitioners have thought it preferable to the preceding preparation, and I am inclined to believe that this opinion is well founded. Cullen gave it in this disease with advantage, and Johnston* states that he cured several cases with it.

Chorea also has been successfully treated with this article. Two instances of this disease, which appear to have been of a very obstinate character, were cured by the sulphate of zinc in the Berlin Polyclinic Institute (Hufeland's Journal, B. 57). The dose was gradually increased from half a grain twice daily, to seven grains. Muller used it with success in this disease.

In chronic hysteria, or general debility, attended with great nervous irritability, the use of this tonic is sometimes peculiarly beneficial. In cases of this kind, I have prescribed half of a grain of the sulphate, with

* Medical Essays and Observations.

the same quantity of ipecacuanha, to be taken three times daily, with highly favourable results.

Lettsom and Crell employed this article with success in habitual palpitations of the heart. Asthma has also been successfully treated with this preparation (Sundelin); and Meglin (Journal de Med. par Corvisart) cured neuralgia of the face and hemicrania, with it. Paris says, that sulphate of zinc, in union with camphor and myrrh, is an excellent remedy in spasmodic cough (Pharmacologia); and Brand mentions it as often particularly serviceable in hooping-cough; Schwartze also states, that he has given it with marked benefit in this affection.

In hysteria, Dr. Lettsom employed this article in conjunction with quassia, and the result, according to his account, was favourable.

Dr. Hewson, of this city, has lately informed me that he has been particularly successful in curing intermittents with this remedy. Dr. S. Ffirth, in a letter to Dr. S. Mitchell, dated Calcutta, 1805, speaks in very high terms of this practice. "The sulphate of zinc," says he, "is a remedy which I have been in the habit of prescribing in several diseases as a tonic, and am of opinion, that when combined with a narcotic anodyne, it may be substituted very advantageously for the Cinchona officinalis. I have often done this in practice, and was seldom disappointed in its good effects."

Brande, too, speaks in the most favourable terms of the article, as a remedy for intermittent fever. He thinks it quite equal to arsenic in this respect. He gives it according to the formulæ below.* I have, myself,

* Sulphat. zinci gr. ii.
Aq. cinnamon ℥iiss.
Aq. distillat. ℥ii.
Tinct. colombæ ℥i.—M. Dose, three table-spoonfuls every three or four hours: or

frequently prescribed this remedy in intermittents, and almost uniformly with complete success; I have usually directed it in the form of pills. One grain of the sulphate with three grains of powdered capsicum made into pills, should be taken every two hours during the intermission, until eight or ten doses are taken.

"In remittent fevers it is a useful and valuable remedy, and can be given when the bark is inadmissible, especially if combined with the extract of hyoscyamus niger. In the remittent form of the malignant fever of Asia, I have given it to the extent of three grains of the hyoscyamus niger, and four of vitriolum album, every hour and a half. I formerly used this remedy with much success." He continues, "in a number of cases of intermittent fever, in Pennsylvania, when I resided at the Philadelphia Dispensary, I had frequently an opportunity of comparing its virtues in the cure of intermittent fever, with bark and arsenic; the result of my experience was, that in many cases it cured where the bark failed; but I found, also, that the bark succeeded in as many cases where the vit. alb. had disappointed me."

I have used the sulphate of zinc with great benefit in chronic rheumatism arising from the long-continued and incautious use of mercury. In one instance, the relief obtained was complete and permanent, after a great variety of other approved remedies had been used, for many months, with little or no advantage. From what I have observed of its effects in this respect, I am inclined to regard it as a valuable remedy in affections of this kind. I have used it in one instance

℞.—Sulphat. zinci gr. iv.
Decoct. cinchonæ ℥xv.
Tinct. gentian. compos. ʒiv.—M. This is to be divided into eight doses, one of which is to be taken every three or four hours.

of syphilitic rheumatism with marked advantage. I gave it in combination with the extract of cicuta, in the proportion of one grain of the former to two grains of the latter. Weil and Crell recommend this article in chronic arthritis. The dose of this medicine, when employed as a tonic, is from one grain to two or three. It is most conveniently given in the form of pills.

For an account of the external use of this remedy, the reader is referred to the article sulphate of zinc, in the chapter on Astringents.

Acetate of Zinc.—From the experience of Orfila, Deveaux and Dejaer, it appears that this preparation may be taken into the stomach in considerable quantities without causing any poisonous or injurious consequences. Henry was the first who employed the acetate as a remedial agent. He recommends it strongly, as an injection in gonorrhœa, and other writers have since expressed opinions equally favourable to its employment in this disease. (Med. Phys. Jour. 1803.) Internally it may be given in doses of from six to fifteen grains; and its powers appear to correspond with those of the oxide and sulphate. Rademacher (Hufeland's Jour. Bd. 62) recommends it in maniacal affections. He affirms that he has known it to produce the happiest effect in cases of this kind. He gave it to the extent of a drachm and a half in twenty-four hours. Dr. Dewees recommends this preparation in the proportion of two grains to four ounces of water as an excellent lotion in the purulent ophthalmia of infants. I have used it with much benefit in this affection.

Muriate of Zinc.—The muriate of zinc speedily deliquesces when exposed to the air—forming what has been called the butter of zinc, (*butryum zinci*). Hufeland recommends a solution of this preparation in sulphuric æther, in the proportion of one part of the dry

muriate to eight parts of the æther, as a very excellent remedy, in the nervous affections, which have already been mentioned as often susceptible of being cured by the oxide of this metal. Hancke (Rust's Magazin. vol. 22, s. 377) strongly recommends this preparation of zinc for the cure of epilepsy. He says, that when the disease arises from a disordered condition of the abdominal viscera or of the spinal marrow, the happiest effects may be expected from this remedy. He directs that two grains of this preparation be dissolved in two drachms of "*spirit muriatico-æthereus*," and given, at first, in doses of four or five drops every four hours, and gradually increased to ten drops. He declares, also, that he has succeeded in curing several cases of *chorea* with this remedy, after a variety of the most approved means and modes of treatment had been ineffectually resorted to. In the Charite at Berlin, this solution was used with much success in chronic pains in the bones and joints. (Hufeland's Journal, Bd. 30, St. 30, p. 15.) The muriate of zinc has, however, been most commonly employed as an external remedy. It is said to be a peculiarly valuable escarotic, producing little or no pain, or general irritation, although sufficiently active, in this respect, for all the purposes of an escarotic. Several German writers prefer it to all other articles of this kind we possess, in old, atonic, fungous, or indurated ulcerations. Two grains of the muriate dissolved in an ounce of water may be applied by means of a dossil of lint, to indolent and fungous ulcers. In old and indolent syphiltic ulcerations it is said to be especially beneficial. When its escarotic effects are desired, the muriate may be sprinkled or applied in a layer over the part. Hancke asserts that in cancerous ulcers, he has known this application to prove more effectual than the usual arsenical pastes.

Applied over the whole ulcer, about a line in thickness, it will in general destroy the diseased parts in the course of eight or ten hours, with but very little pain, and without exciting much inflammation in the surrounding parts. In every affection, in short, where an escarotic may be deemed proper, this article, it is said, may be used with as much, if not more advantage, and with less suffering, than any other application of this kind. Internally this dose of the muriate is from one-eighth to one-fourth of a grain. Hufeland's *ætherial solution* may be given in doses of from five to ten drops, three times daily.* It should, however, always be given with caution, for in over doses, it has been known to produce pain in the stomach, nausea, retching, a feeling of distress in the region of the heart, short and anxious respiration, a small and rapid pulse, cold sweat, syncope, and spasms.

Hydrocyanate of Zinc.—This preparation of zinc has not yet been introduced into any Pharmacopœia. According to the experience of Hufeland, (Hufeland's Journ. Vol. 50, No. 3, p. 106,) and of Henning, (Ibid. Vol. 56, No. 6, p. 80,) however, it highly merits the attention of the profession, as a remedy in certain spasmodic and nervous affections. In gastrodynia and spasmodic affections of the stomach, the former of these eminent physicians declares he has found it a most valuable medicine. He commenced by giving one grain three times daily, and gradually increased the dose to four grains. Henning employed this preparation in chronic hysteric affections, in the epilepsy of children during dentition, and in spasms of the stomach, with decided advantage. In the Berlin Clinic Institute, two cases of obstinate chorea were cured

* Richter's Spec. Arzneimittell., Bd. iv. p. 535.

with this remedy, though not until its use had been continued a long time and in large doses. (Hufeland's Journ. B. 57, No. 6, p. 56.) In these two cases the dose was gradually increased from one-third to seven grains, given twice daily.*

BISMUTHI SUBNITRAS.—*Olim* OXIDUM BISMUTHI.

Magistery of Bismuth.—This is the only preparation of bismuth employed for medicinal purposes. It consists of a white, inodorous, and insipid powder, sparingly soluble in water, and in the solutions of the fixed alkalies. In ammonia it dissolves more readily. When exposed to the light, or to the action of hydro-sulphuric acid, it acquires a dark and almost black colour; requiring, hence, to be kept in well stopped bottles, and in a dark place, in order to preserve its white colour, and prevent any change in its composition.

It is not more than twenty-eight years since this remedy was introduced into practice by Dr. Odier,† of Geneva, and De la Roche, of Paris. Its remedial virtues had, however, been particularly noticed by Jacobi,‡ nearly a century before Dr. Odier published his observations on its employment; but it does not appear that it had attracted the attention of the profession anterior to the publication of Dr. Odier's paper.

The medicinal powers of this article do not differ very materially from those of the oxide of zinc. Given in inordinate doses, it is apt to give rise to nausea, a sense of constriction in the epigastrium, anxiety, vomiting, giddiness, prostration, and a small and weak pulse.

* Richter's Specielle Arzneimittell., vol. iv. p. 523.

† Journal de Médécine, 1786, tom. lxviii. p. 49.

‡ L. F. Jacobi de Bismutho. Erford, 1697, 4 Burdach.

The diseases in which it has been particularly recommended, are, gastrodynia, spasms of the stomach, hysteric colics, pyrosis, and other dyspeptic complaints. The testimony of Dr. Marcet, Dr. Bardsley, and Clark, in England; of Hufeland, Reil, Krysig, Belsen, &c. in Germany, and of Dr. Hosack, and Moore, in this country, are strongly in favour of the remediate powers of this article, in this disease.

At present its employment is chiefly confined to the cure of gastrodynia, pyrosis, and cardialgia. In these affections it seems to be pretty generally admitted to be a medicine of much value. Dr. Marcet, whose testimony deserves great respect, in a paper read in 1801, before the London Medical Society, says, "I have since had frequent opportunities, at Guy's Hospital, of trying the oxide of bismuth in spasmodic affections of the stomach, and those trials have fully confirmed the opinion which I formerly gave of the utility of this medicine." Dr. Samuel W. Moore, of New York, in his excellent dissertation on the medical virtues of the white oxide of bismuth, relates three cases of painful affections of the stomach, in which this remedy was employed with much success. I have employed it in several cases of spasmodic pain of the stomach, and in two its effects were decidedly beneficial; though in the others, which appeared to me perfect cases of gastrodynia, it had not the slightest effect whatever. Upon the whole, however, the evidence we have in favour of the powers of this remedy, in the diseases mentioned, entitles it to much attention from the profession. This remedy has also been used with advantage in dysmenorrhœa. Durr states, that he has used it in this affection in combination with castor and belladonna with marked success. Robertson says, that

he used this article with great benefit in a case of protracted salivation.

It is said, that this article is particularly efficacious in neuralgic pains of the stomach, when administered in combination with belladonna. In cardialgia it may be very advantageously given in union with calcined magnesia. (Hufeland's Journ. Vol. 46, No. 2, p. 9.)

Carminati (Opusc. Therap. Vol. 1,) asserts, that he has not only found this article highly beneficial in gastrodynia, but also in debility with morbid sensibility of the stomach; and Bardsley and Yates strongly recommend it as a tonic in dyspepsia, attended with spasmodic pains,* and increased sensibility of the stomach. It has also been employed with success in violent and spasmodic vomiting. (Kopp.) According to the experience of Durr, a German writer of considerable reputation, the oxide of bismuth is an excellent remedy in dysmenorrhœa. He gave two grains in combination with a grain of the extract of belladonna, and half a grain of calomel every three hours.† Epilepsy, also, has been successfully treated with this remedy. Lobenstein-Loebel says, that it is most apt to prove advantageous in those cases of epilepsy which arise from gastric iritation. He gave it in union with the essential oil of valerian.

This medicine may be given in the dose of from two to ten grains three or four times a day. Hufeland says, that its virtues are increased by being given in combination with the extract of hyoscyamus and ol. cajeput. Odier gave it a quarter of an hour before eating, and to the extent of twelve grains for a dose.

Externally the oxide of bismuth has been much used

* London Quarterly Journal, vol. viii. p. 295.

† Hufeland's Journal, Bd. lvi. St. v. p. 48.

by females as a *cosmetic*, that is, for the purpose of beautifying and improving the complexion. In the form of ointment it is said to be a very efficient remedy in herpetic and other chronic cutaneous affections. Mixed with lard, in the proportion of one part of the oxide, to three of the lard, it has been used with prompt success in the itch. (Schroder, Richter.) Odier, and Hahnemann assert that tooth-ach will often speedily subside by taking a portion of the oxide of bismuth into the mouth.* I do not know a better application to excoriated and tender nipples than an ointment composed by mixing a drachm of this article with an ounce of fresh lard.

ARGENTUM.

Metallic Silver.—It has been asserted, that silver in its metallic state, taken into the stomach, produces tonic and alterative effects on the system. Meyer affirms that he has used the filings of silver with the happiest effects in obstinate intermitting fevers. He states that a single dose of fifteen grains taken just before the accession of the paroxysm, was in general sufficient to arrest the disease. (Hufeland's Journal, Bd. 64.) Richter, however, thinks that the effects ascribed to the silver by Meyer, depended on the small portion of copper with which this metal is usually alloyed, and this opinion is not at all improbable.

Nitrate of Silver.—The nitrate of silver, when fused and cast into small cylindrical pieces, forms the lunar caustic of the shops. These pieces are of a dark gray colour, and break with a shining crystalline fracture.

* Voigtel's Arzneimittell. 2 Abth. Bd. iii. p. 436. Richter's Arzneimittell.

The lunar caustic possesses no odour, but it has an exceedingly austere, bitter, and metalline taste. It is soluble in an equal weight of water at 60°; it also dissolves in alcohol.

In another place I shall have occasion to speak of the employment of this substance as an escarotic; in the present place, therefore, I have only to notice its remediate powers as a tonic, and alterative.

The nitrate of silver holds a high rank among our remedial agents. As a remedy for *epilepsy*, its reputation is equal, if not superior, to that of any other article of the materia medica. We find it mentioned by Paracelsus and Stahl, as possessing highly useful powers in this respect. Dr. Simms, of London, relates several cases in which this remedy was successfully employed.* Dr. Cappe,† also, speaks well of the powers of this medicine in epilepsy. Nord, a German writer, gives an account of a case of epilepsy complicated with mania, in which the nitrate of silver was employed with complete success.‡ It has also been successfully used in the disease by Dr. Gough,§ Sir Henry Halford,‖ and Dr. Roget.¶ Sementini, an Italian physician, declares it is more efficacious in this disease, than any other remedy we possess. It ought to be given, he says, in combination with a vegetable extract. This writer states, also, that he found it successful in paralysis.** He says that a cutaneous eruption, of a pustular kind, frequently appears in those who are taking this remedy; and that when this takes place, we may

* Mem. of the Med. Society of London, vol. iv. p. 379.
† Arzneimittellehre, Bd. iv. p. 419.
‡ Medcinishe National Zeitung, 1798. Sup. No. xiii. s. 206.
§ Medical Museum, by Dr. J. R. Coxe, vol. iii. p. 70.
‖ Medico-Chirurgical Transactions, vol. ix. p. 236.
¶ Ibid. vol. vii.
** Giornale di Fiscia, tom. xi. p. 355.

be assured of the beneficial influence of the medicine. Loebenstein-Lobel (Wesen. und Heil. et Epilepsie, p. 243) recommends the following combination as peculiarly valuable in this affection, when the digestive powers are not particularly impaired.* Other names might be added in testimony of the efficacy of this medicine in epileptic complaints. Many practitioners, however, who have prescribed this remedy, in the present disease, have been entirely disappointed. In my own practice, it has but very seldom produced any decided advantages, although I have given it largely and perseveringly in several instances. Nevertheless, the successful instances treated with this remedy are so numerous, and so well attested, that nó doubt can be entertained of its especial efficacy in the symptomatic forms of the disease. Since the second edition of this work has been published, I have witnessed its successful employment, in a well-marked and obstinate case of this disease.

The nitrate of silver has also been used with advantage in other convulsive affections. Wolf speaks very favourably of it as a remedy for tremors and sympathetic palpitations of the heart; and Dr. Powel, of London, has published cases of its successful use in chorea.† It has also been employed with marked success in this singular spasmodic affection, by Dr. Franklyn (Med. and Phys. Jour. 1815, April), and by Dr. Bruce. (Med. Chir. Transact. 1818, Vol. 1, p. 1.) Pitschaft declares, that the nitrate of silver is one of the most valuable, if not the very best remedy we possess for chorea. (Hufeland's Jour. Vol. 51, No. 3, p. 54.) Priou states that he

* ℞.—Nitrat. argenti, gr. x.
Extract cicutæ, ℈i.
Extract valerian, ʒi.—M. Divide into one grain pills. Take three every morning and evening.

† Med. Transact. of the College of Phys. of Lond. vol. iv. 1813, p. 85.

cured two cases, which had previously resisted a long course of judicious treatment, by a combination of the nitrate of silver, opium, musk, and camphor. (Jour. Generale de Med. Vol. 87, p. 299.)

This remedy has likewise been employed with success in agina pectoris, dropsy, and leucorrhœa. "In several instances of leucorrhœa," says Dr. Thacher, "the nitrate of silver has been employed in doses of one-twelfth of a grain three times a day, with complete success." Bayle and Geoffroy speak favourably of its effects in dropsy.

In combination with cicuta, I have, in a few instances, prescribed this article with excellent effect in scrofulous ulcerations. In old constitutional ulcers, the nitrate of silver, administered in doses of from gr. i. to vi. three times a day, has been known to prove highly beneficial. I once prescribed it with complete success in an alarming case of ulceration of the gums and jaws, from the imprudent use of mercury. A part of the palate and upper jaw, with the two middle incisors, had already come away, and the ulceration was spreading rapidly. I administered the fourth of a grain of the nitrate of silver, three times a day, and by this remedy alone, succeeded without difficulty in arresting the disease. This preparation is, indeed, highly recommended by Hahnemann, in the treatment of mercurial diseases. Dr. Roberts, an English writer, employed it with much benefit in counteracting the deleterious effects of lead.

I have employed this article with great advantage in aphtha, and in chronic inflammation of the mucous membrane of the stomach and bowels. In these affections it should be given in a liquid form, and in very small doses. The one-eighth or one-sixth of a grain dissolved in a mucilaginous fluid, may be given every four hours.

The nitrate of silver may be given from one-fourth of a grain to six grains; gradually increasing the dose. Nord began with half a grain, and gradually augmented the dose to fifteen grains, three times a day. I have frequently given it to the extent of six grains.

It is now ascertained beyond a doubt, that the long continued use of nitrate of silver is capable of giving a permanent black colour to the skin. The late Dr. Albers, of Bremen, relates several cases of this kind.* A case, also, is reported by Dr. F. Harrold, of England, in which the skin became nearly black in consequence of the internal use of this remedy;† and Sir H. Halford gives an account of a person who took it for a year and a half, and whose skin, at last, assumed a permanent dark hue.‡.

The incompatible substances are, "fixed alkalies and alkaline earths; the muriatic, sulphuric, and tartaric acids, and all the salts which contain them; soaps, arsenic, hydro-sulphurets, astringent vegetable infusions, undistilled waters." It does not deliquesce when free from copper.

For an account of the employment of this article as an external remedy, see the article *lunar caustic*, in the chapter on Escarotics.

Formulæ.

℞.—Argenti. nitrat. gr. xii.
G. opii gr. x.
Extract. gentian. ʒi.—M. Divide into sixty pills. Take three pills, twice daily—gradually increasing the dose according to circumstances.

Liquor argenti muriatico ammoniati.—Kopp has given the following directions for making this preparation, which he asserts to be in many respects decidedly

* Vide Eclectic Repertory, April, 1816.
† London Med. Repository, vol. v. May, 1817.
‡ Medico-Chirurg. Transact. vol. ix. p. 237.

superior to the nitrate—more especially in epilepsy. Dissolve ten grains of lunar caustic in two ounces of distilled water; filter, and add a sufficient quantity of muriate of soda dissolved in water, to precipitate the solution. The precipitate is to be carefully washed, and dissolved in ʒiss. of caustic aq. ammon. Then add to this solution ʒiii. of muriatic acid. The dose for a child from five to ten years old is three drops, in a table-spoonful of water, three times daily. During the use of this preparation all acids and acescent articles of food should be avoided.

AURUM.—GOLD.

During the ages of alchemy, gold enjoyed considerable reputation as a medicine. It had, however, sunk into entire neglect, when Dr. Chrestien,* in 1811, published his observations concerning its remedial powers, and again brought it to the attention of the profession. This writer adduces a number of facts illustrative of its efficacy in syphilitic and scrofulous cases; and asserts that the employment of gold is not liable to the same inconvenience which occasionally attends the use of mercury. It cures the disease without exciting ptyalism; and unless given in too large doses, produces no sensible disturbance in the system. No particular care as to regimen is required during its employment, and the patient, we are told, may go about his ordinary business; nay, it is even stated, that the remediate employment of gold admits of a generous diet and the moderate enjoyment of wine. The preparations which he used are: metallic gold, in the state of minute divi-

* Observations sur un Nouveau Remède dans le Traitment dés Maladies Venèriennes et Lymphatices, par A. Chrestien, à Paris, 1811.

sion; oxide of gold, precipitated by potash; the oxide precipitated by tin; and the triple muriate of gold and soda. Of these preparations the muriates are vastly more powerful than the oxides and divided gold. The latter is the weakest of them all. Orfila ranks the muriate of gold among the poisonous substances; and Chrestien asserts that it is incomparably stronger than corrosive sublimate. He administered it in doses, at first no larger than one-fifteenth of a grain, and if pushed beyond one-tenth of a grain, it never failed to excite fever and inflammatory symptoms. The oxide he gave in doses of from half a grain to two grains, and the metallic gold to the extent of three grains daily.

Duportal, who, in conjunction with Pelletier, published a very interesting memoir on the preparations of gold, adds his testimony in favour of the efficacy of this remedy in syphilitic complaints. He relates a remarkable instance of the good effects of these preparations in a cancerous ulcer, "that had destroyed the upper lip, attacked the soft parts of the nose and left cheek, destroyed the square bones, and rendered the maxillary bone carious." Notwithstanding the very high terms in which the auriferous preparations have been spoken of by Drs. Chrestien, Duportal, Plenciz, and others, it does not appear that they are much attended to at present in the treatment of any diseases. Pontin, and several other Swedish physicians, who have tried this remedy, state that they never obtained any real advantages from its use.

In this country the reports of several eminent practitioners have not been very favourable in relation to the power of this remedy in scrofulous and syphilitic diseases. Dr. Hosack and Dr. Francis saw several cases in which the syphilitic symptoms returned after

they had disappeared under the use of the gold. It ought to be observed, however, that this is not unfrequently the case even with the acknowledged specific, mercury, when too soon discontinued, or improperly used. It would appear, also, from the experience of these and other physicians, that the muriate of gold is of doubtful efficacy in the secondary symptoms of this disease.* To this, however, we may oppose the evidence of Dr. Samuel L. Mitchell, who, in a communication to Dr. Dyckman, says, "the efficacy of this medicine has been tried year after year in the New York hospital. My practice with it there has been witnessed by all the attendants of the wards. It possesses admirable virtues against syphilis. Without presuming to affirm that it is capable of eradicating the distemper in every instance, my opinion, upon the whole, is, that the muriate of gold will effect all that is achieved by muriate of quicksilver, with incomparably less inconvenience to the patient. He gets well under the operation of the former without the hazard of a sore mouth or a salivation, and with very little wear and tear of constitution. I consider the introduction of this preparation into common use as one of the greatest improvements in modern medicine; and I wish it were already as universal as the malady it is intended to remove. The muriate of gold is found to increase the quantity of urine, in many instances, to such a degree, that it ought to be ranked among the diuretics of the materia medica."†

I have employed the gold in two cases of secondary syphilitic ulcers of long standing; in one of these there was an evident amendment in the appearance of the ulcers, but I could not succeed in curing them by this

* Dyckman's Dispensatory, p. 201. † Ibid.

remedy; the other case yielded to its powers, and the patient has since remained perfectly well. In both cases I had previously employed mercury for a long time, but without any good effects whatever. I have also administered it in a case of scrofulous ulcerations, and succeeded very soon in healing up the sores. The cure was not, however, permanent. In a recent memoir on the remediate properties of gold, by Dr. J. C. Niel, a French physician, it is asserted, "that the aurific preparations are exceedingly efficacious in tinea, elephantiasis, and scrofula." This writer states, that the preparations of gold sometimes excite salivation; which, however, is not attended by the unpleasant effects that arise from a mercurial salivation. It seldom produces much inflammation of the mouth, and does not affect the teeth, nor is it attended with a fœtid breath.*

From what has already been published in relation to this remedy, it is sufficiently evident that it possesses very important powers. We, however, want much more ample experience upon this subject before we can decide upon its real merits, and the particular cases to which it may be especially adapted.

Dr. Chrestien administered the different preparations of this metal by friction on the gums. It may, however, be more efficaciously used internally, either enveloped in some mucilaginous liquid, or in the form of pills. The pure muriate cannot be well given in this latter way, as it is much too caustic and deliquescent. For this purpose the triple muriate of gold and soda must be employed. This may be given from one-fifteenth to one-eighth of a grain, gradually increasing the dose. According to M. Figuer the pure muriate may be conveniently given in the following mode: dissolve sixteen grains of the salt in one ounce of water; pre-

* London Med. and Phys. Jour. vol. xlvii. p. 248.

serve this solution in a vial well closed, and seclude it from the light. Half a drachm of this may be made into pills, with starch or the crumbs of bread, or by being mixed with a sufficient quantity of some mucilaginous fluid to obtund its acrimony—it may be taken in a liquid form. The oxide is given in much larger doses. Dr. Chrestien gave it from half a grain to two grains. Other practitioners have, however, given it to a much greater extent. Van Mons administered from twenty to twenty-five grains. The report of this physician is much in favour of the efficacy of this preparation. He found it particularly efficacious in curing chancre.*

ARSENICUM.—ARSENIC.

Arsenic is a hard gray-coloured metal, of a granular texture, and great brittleness. In its metallic state it does not effect the animal economy. Combined, however, with a certain portion of oxygen, it forms the white oxide of arsenic, or arsenious acid of the shops—the most active mineral poison with which we are acquainted. The oxide of arsenic is generally found in the form of white semivitreous lumps, exhibiting, when pulverized, the appearance of white sugar. When exposed to a heat of about 383° of Fahrenheit, it rapidly volatilizes in white *inodorous* fumes. The alliaceous or garlic-like smell does not belong to the oxide of arsenic in a state of vapour, but is wholly confined to the fumes of metallic arsenic. When the oxide of this metal, or the common arsenic of the shops, is thrown upon hot charcoal, the garlic smell of the fumes is quite perceptible. But in this instance the

* Burdach, Arzneimittellehre, vol. ii. p. 208.

oxide is decomposed, the oxygen uniting to the charcoal, and the metal escaping in the form of fumes, having a garlic odour.

"It is stated by Orfila and other chemists," says Dr. Paris, "that if it be projected upon heated copper, the alliaceous odour is evolved. This, however, takes place only when the copper is in a state of ignition, at which temperature its affinity for oxygen enables it to reduce the arsenious acid; for I find, by experiment, that if a few grains of this substance be heated on a plate of copper, by means of a spirit-lamp or blow-pipe, no odour is perceptible, for the whole of the acid is dissipated before the copper can acquire a sufficiently exalted temperature to deoxidize it. If the arsenious acid be heated on a plate of zinc, the smell is not evolved until the metal is in a state of fusion; if, instead of these metals, we employ in our experiments those of gold, silver, and platina, no alliaceous smell whatever is produced at any temperature." The knowledge of this fact is of considerable importance in employing this experiment as a test for arsenic; for it is evident, that if the substance suspected to contain the white arsenic be subjected to heat, without being in contact with any substance capable of depriving it of its oxygen, no alliaceous odour will be evolved.

The oxide of arsenic combines with potash, soda, and liquid ammonia to saturation, forming soluble arsenites, and possessing, therefore, some of the essential properties of acids.

According to the accurate experiments of Klaproth, it takes four hundred parts of water at 60°, to dissolve one part of the oxide of arsenic, and only thirty parts at 212°. If it be boiled in water, and the solution be suffered to cool, it will retain thirty parts of it to one thousand of water, and deposit the superfluous part in

the form of tetrahedral crystals. "This fact," observes Dr. Paris, "shows the importance of employing boiling water in every chemical examination of substances supposed to contain arsenious acid." The oxide of arsenic is also soluble in alcohol and oils.

The oxide of arsenic acts with great violence when taken internally, and commonly destroys life in a very short time. When taken in too large a dose, as for instance, one-fourth of a grain, it excites nausea and slight chills. By continuing it in such doses, it destroys the appetite, excites vomiting, pains in the stomach and bowels, painful diarrhœa, great anxiety and oppression in the breast, debility and emaciation, numbness of the hands and feet, dropsical swellings, tremors and paralysis. In doses above a grain it destroys life, with symptoms denoting inflammation of the alimentary canal. It is generally believed to produce its deleterious effects by acting directly on the villous coats of the stomach and bowels, producing inflammation and ulceration of these parts. This idea is certainly countenanced both by the appearances on dissection, and by the corrosive quality of this substance. Mr. Brodie, however, rejects this explanation of its modus operandi, and thinks himself warranted to conclude, from several experiments which he performed on this subject, that arsenic enters into the circulation, and that it produces its effects by acting at once upon the nervous system, the organs of the circulation, and the alimentary canal; and that death depends immediately on a suspension of the functions of the brain and heart.* This opinion is also entertained by Orfila. Dr. George F. Jaeger, of Stutgard, in a very elaborate and interesting dissertation on the effects of arsenic on various organized bodies, adduces a number of strong argu-

* Philosophical Transactions for the year 1812.

ments to prove that arsenic does not produce its deleterious effects by a local action on the stomach and bowels, "nor in the manner of the acrid poisons, nor upon the nervous system; but is analogous to the poison of the viper and ticunas, which act primarily upon the blood."* It appears from the experiments of Jaeger, that arsenic is entirely inert when applied directly to a nerve. That death from arsenic does not depend on the inflammation or local lesion which it produces in the part to which it is applied, is rendered certain by the fact, that it has been known to destroy animals in a short time on being applied to wounds. Sprægel states that he sprinkled a drachm of arsenious acid into a recent wound on a dog's back, and that the death of the animal took place at the end of five hours.† It is a remarkable fact, also, that when arsenic destroys life on being applied to a wound, it often produces nearly the same organic effects on the membranes of the alimentary canal, as when taken internally. In the experiment just mentioned from Sprægel, "the stomach and intestines were greatly inflamed, both on their exterior and interior surface; coagulated blood was effused into their cavities, and had insinuated itself between their coats. The pleura, pericardium, and lungs appeared very inflamed." Hunter, Home and Brodie have made the same observations. Arsenic has even been known to destroy life, when taken internally, without leaving any very manifest traces of inflammation on the stomach and bowels. There can be no doubt, however, that the extensive disorganization which this mineral commonly produces in the coats of the alimentary

* Edinburgh Med. and Surgical Journal, January, 1811. Dissertatio Inauguralis de Effectibus Arsenici in Varise Organismos, &c. Auctor. G. F. Jaeger, 1808, Tubingæ.

† Orfila's Toxicology, vol. i. p. 114. Sprægel Experimenta circa varia Venena. Disp. Med. Goet. 1753.

canal is sufficient, independent of any other effects, to destroy life; and it is, probably, in this way that it is most frequently fatal when received into the stomach. Arsenic is not only destructive of animal, but also of vegetable life. From M. Jaeger's observations, it appears that "the death of vegetables is induced by arsenic from the gradual absorption and distribution of the poison by the vessels and cellular membrane, so that the parts die in succession as the particles of the arsenic reach them." Paris states that the influence of arsenical vapours near the copper smelting works of Cornwall and Wales, "is very apparent in the condition both of the animals and vegetables in the vicinity."

Arsenic, like most other powerful substances, may be applied to very important remedial purposes. It was employed as an external remedy, both by the Greek and Arabian physicians. Dioscorides recommends its use in this way; and Athenæus speaks of some arsenical preparation as very beneficial in the form of a clyster in dysentery. It is only in modern times, however, that the medicinal powers of arsenic have been particularly noticed as an internal remedy. Nearly a century ago it was recommended in the cure of intermittent fevers by Jacobi;* and the observations of Brera and Fowler have since brought it into general notice as a remedy in this disease. By many physicians it has, indeed, been very highly extolled, and its reputation as an efficacious medicine is now well established. It is not, however, to be employed with equal advantage, or even with safety, in all cases of this disease. In patients of debilitated and cachectic habits of body,

* Burdach, Arzneimittellehre, vol. ii. p. 475. Jacobi de Arsenici Sale alcalico domiti usu interno salutari, (Acta Academ. Elect. Mogunt. tom. i. p. 116).

especially where a scorbutic tendency, or a disposition to passive hæmorrhage exists, this remedy is apt to produce dropsical swellings, great debility, and symptoms of general depravation. It is, also, said to act perniciously in phthisical persons, or where there exists a strong inflammatory diathesis.

Examples of this kind, I have occasionally observed in my own practice, and I feel entirely satisfied, that, although a very powerful remedy in the majority of cases, it cannot be indiscriminately employed without running some risk of doing injury. The state of the system in which arsenic appears to be peculiarly calculated to do good in this disease, is the very opposite of that which I have just mentioned as inimical to its remediate powers. In cases attended with considerable fulness of habit, not very irritable or debilitated, with a moderately full, soft, and regular pulse during the intermission, and unaccompanied by any local congestions, or organic affections of internal parts, the arsenic will, in general, act as a very efficacious and safe remedy.*

Dr. Thomas D. Mitchell, a very intelligent physician of this city, states, that while practising at Norristown, in 1820, where he had an opportunity of seeing many cases of intermittent fever, he found the bark ineffectual in the majority of instances, whilst arsenic, in the form of Fowler's solution, given from fifteen to twenty drops, almost uniformly proved successful. He never observed any injurious effects to follow its exhibition. Before giving such large doses, he had tried the ordinary ones, as from eight to ten drops, but his patients

* "It is a very extraordinary fact," says Dr. Paris, "that previous to the establishment of the copper-works in Cornwall, the marshes in their vicinity were continually exciting intermittent fever, whereas, since that period, a case of ague has not occurred in the neighbourhood."—*Pharmacologia*, p. 282.

derived no advantage from the medicine when given in this way. It appears, therefore, from the statement of this physician, that where arsenic is indicated, it ought to be given in as large doses as the stomach will bear, it being much more promptly efficacious; and not more detrimental to the general habit, when thus administered, than when given in smaller doses. To children from two to five years old, he gave from one to six drops of the solution three times a day.

M. Gasc, a French physician of eminence, has lately published the result of his experience with this remedy, in the cure of intermittents. His observations were made at the hospitals of Dantzic. "The number of patients, with this fever, was so great in the hospital," says the physician, "and the disease had been so rebellious to the ordinary modes of treatment, that I determined to have recourse to the use of arsenic. My first trials with it were so satisfactory, and the successful results so numerous, that I did not hesitate to extend the use of it to almost all the cases of fever of that species in the hospital, without regard to particular complications of disease, provided they were not of a nature to contraindicate it in a positive manner." The result, he states, was highly satisfactory.*

I have myself been a good deal in the habit of employing arsenic in the cure of this disease; and have occasionally found it successful where I could do nothing with the cinchona. These two remedies are, indeed, adapted to very different states of the system. The cinchona is most efficacious in a relaxed and exhausted state of the system, and will often disappoint our expectations in persons of a full and robust habit

* London Med. and Phys. Jour. Feb. 1817.

of body. In intermittents, attended with a phlogistic habit, the bark is always more effectual after the general powers of the system have been somewhat reduced by evacuants.

On the contrary, however, the arsenic, as has already been stated, would seem to be best suited to the cure of this disease in persons of a firm and healthy constitution, and most apt to act injuriously when given in a debilitated, cachectic, and irritable state of the system.

I have hardly ever employed arsenic in this disease without giving it in conjunction with opium. I have usually given the laudanum and arsenic separately: the former in the dose of from ten to fifteen drops, about half an hour after the dose of the latter. By this plan we avoid the disagreeable sickness which effectual doses of the arsenic are apt to create, and it does not appear that its powers are lessened by this mode of exhibition. This remedy has, also, been prescribed in combination with bark. These two substances are, however, chemically incompatible, the arsenical solutions forming precipitates with the bark,—a circumstance which renders this combination of doubtful propriety.

Dr. Ferriar speaks very favourably of the use of arsenic in the last stage of typhus, when the tongue is covered with a thick black crust, and the ordinary tonics and stimulants do not produce any beneficial effects. By the use of arsenic, he says, the tongue very generally becomes clean.*

Arsenic has, also, been recommended as a useful remedy in rheumatism. In the chronic variety of this complaint, I have, in a few instances, employed it with remarkable advantage. But the powers of this remedy are more decidedly evinced in syphilitic rheumatism,

* Medical Histories, vol. i. p. 84.

and in that variety which is sometimes the consequence of the imprudent use of mercury. In rheumatic pains from this latter cause, I know, indeed, no remedy which is so effectual as the present one. Among the writers who speak more particularly in favour of the remediate powers of arsenic in chronic rheumatism, may be mentioned Kellie, Hardman, and Jenkinson.

Favourable reports have, also, been published of the effects of arsenic in epilepsy. Drs. Duncan and Alexander give examples of its successful employment in this disease.

Dr. Ferriar speaks well of the powers of arsenic in hooping cough, after the inflammatory symptoms have been subdued by antiphlogistic remedies. "In the beginning of this disease," says he, "when it is accompanied by symptoms of fever and inflammation, bleeding is sometimes necessary. Blisters are more frequently necessary, and Dr. Armstrong's plan of exhibiting tartarized antimony, in doses which prove gently emetic, is undoubtedly very useful; chiefly, perhaps, by supplying the means of expectoration to very young children. But, after these preliminary steps are taken, I believe that the only remedy which promises to shorten the disorder effectually, is the solution of white arsenic." He gave it, at first, in the dose of one drop, for an infant; and to children under seven years, he gave two drops, daily. Dr. Klapp of this city, informed me, that he has found the arsenic decidedly beneficial in the present disease. I have given it in some cases, in a few of which its good effects were conspicuous.

Arsenic has also been prescribed with success in spasmodic asthma. Dr. Alexander mentions its successful employment in this way. Of its powers in this disease I know nothing from my own experience.

Some accounts have, also, been published of the

successful employment of this remedy in tic douloureux. Dr. M'Kechnie, surgeon at Paisly, relates a case which was cured by arsenic, after various modes of practice had been tried ineffectually.* Hardman and Jenkinson, also, commend its powers in this painful affection. In periodical tic douloureux (neuralgia), arsenic is, without doubt, among the most valuable remedies we possess. Maccullock states that he has seldom known it to fail, in cases of this kind.

Arsenic has recently been employed with much success in chorea. In the fourth volume of the Medico-Chirurgical Transactions, a case of this disease is related, which yielded without difficulty to this remedy. Mr. Salter, also, has given an account of four cases of chorea successfully treated with this medicine.†

Mr. Hill, in an excellent paper published in the Edinburgh Medical Journal, recommends arsenic as a highly useful remedy in hemicrania. I have in several cases of this kind found it promptly successful, and I know of other practitioners who place great reliance on its powers in this complaint.

In that species of cephalalgia which is commonly called sick headache, arsenic has been known to afford permanent relief. To Dr. Mease, of this city, we are indebted for the first account of its efficacy in this painful and troublesome affection. Several cases are related by this respectable physician, in which this remedy was used with perfect success. In one case I have known it to be employed with great advantage; the disease was greatly mitigated, but not completely overcome. Dr. Otto, also, employed it with success in a case of this kind.

In old and obstinate syphilitic ulcers, much benefit has been derived from the employment of this remedy.

* Edinburgh Medical and Surgical Journal, July, 1811.

† Medico-Chirurgical Transactions, vol. x. part. i. p. 218.

It is particularly recommended in such cases by Remer, Hagstrom, and Horn.* I have known it to be used with complete success in a case of venereal ulcerations of the septum of the nose, under the care of Dr. M'Clellan, of this city.

In the treatment of venereal nodes, arsenic is an exceedingly useful remedy. Dr. Colhoun, of this city, was, I believe, the first who published any account of its efficacy in these affections. His experience with this remedy, as published in the third volume of the American Medical Recorder, is directly in favour of its powers in this way; and Dr. M'Clellan, one of the surgeons of the Philadelphia Alms-house Infirmary, informs me that he has used it with success in several cases of this kind, and particularly in swellings of the periosteum. A remarkable case of the efficacy of arsenic in venereal nodes, is reported by Dr. M. S. Baer, of Baltimore,† and my experience enables me to speak with much confidence of the utility of this practice.

Charles Lane, esquire, gives a very interesting account of the successful employment of arsenic in an ill-conditioned ulcer of the tongue. The ulcer extended through the substance of the tongue, and passed through its root into the throat. "The general appearance," says he, "was most alarming, bearing a very strong character of carcinoma." By one month's use of this remedy the ulcer appeared perfectly healed; it, however, broke out again, and was again cured by the same means, and finally got perfectly well under its use.‡

* Burdach's Arzneimittellehre, vol. ii. p. 469. Horn's versuche mit gebrauche des Arsenicks in veralterter Syphilis, in his Archives of Medical Experience, vol. iv. No. 257. See also Remer's Observations in the same work, vol. i. No. 9, 1812.

† American Medical Recorder, vol. iv. p. 461.

‡ Medico-Chirurgical Transactions, vol. viii. p. 201.

Arsenic is a very useful remedy in certain obstinate cutaneous affections. It has been particularly recommended in leprosy and ichthyosis. "In the lepra vulgaris," observes Dr. Batemen, "the arsenical solution recommended by Dr. Fowler, is often extremely beneficial, in doses of four or five drops, which may be slowly increased to eight, and persevered in for a month and more.* In a mild case of ichthyosis, the same writer states that, "this medicine produced a complete change of the condition of the cuticle, which acquired its natural texture."† It has also been used with advantage in elephantiasis, and other chronic affections of the cuticle.

Arsenic has been employed both internally and externally in the cure of cancer. It is said to allay the pain, in the ulcerated stage of this affection, without producing either stupor or disposition to sleep. It has, however, been chiefly extolled in cancer as an external remedy. Applied in this way, it acts as an escarotic, destroying the diseased parts without affecting the sound ones, and thus enables the surgeon, in some instances, to remove the whole of the diseased parts. Richter speaks very favourably of its use in cancerous ulcers. "I have employed arsenic," says he, "in cancerous ulcers of the face, with much advantage, and without any bad or remarkable effect. I have generally used Bernard's mixture.‡ I lay it on about the thickness of the back of a knife. The pain which it

* Practical Synopsis of Cutaneous Diseases, p. 33. Philada. edition.

† Ibid. p. 53.

‡ This mixture consists of factitious cinnabar ʒii., ashes of burnt shoe soles gr. viii., dragon's blood gr. xii., white arsenic gr. xl. Reduce them all to a fine powder and mix them intimately. "When it is used some of it is mixed with so much water as to form a thin paste, which, by means of a small hair-pencil, is applied to the whole surface of the ulcer." Richter calls this Bernard's preparation, but it was first employed and published by the celebrated lithotomist, Frère Cosme.

occasions is, for the most part, inconsiderable."* He mentions several cases in which this mixture was applied with the most remarkable success. I have known the arsenical solution, weakened by water, to be injected into the vagina in cancer of the uterus, with evident advantage. It has, also, been applied to cancers in the form of an ointment. Plunkett's ointment† had, at one time, very considerable celebrity in this affection. M. Dupuytren speaks very favourably of a combination of the oxide of arsenic and calomel, as a topical application in *noli me tangere*. "The actual cautery and arsenical paste seem to irritate the affected part, besides adding to the deformity, and destroying the parts to which they are applied. In such cases, a powder composed of one hundred and nineteen parts of calomel and one part of arsenic, acts like a charm. If the surface of the ulcer is moist and clean, the powder is to be sprinkled on so as to form a thin coat. If the diseased surface is covered with a crust, a poultice must previously be applied to remove it. If an imperfect cicatrix cover the sore, this must be removed before the powder is applied. If the powder does not adhere, increase the proportion of arsenic, and mix it with mucilage. The powder must be left to fall off of itself, which usually happens in about ten days, when it is to be reapplied. Five or six applications are generally sufficient.‡"

Arsenic is now usually prescribed in the form of Fowler's solution. The dose, for an adult, of this, is from eight to fourteen drops. It may, also, be given in

* Medical and Surgical Observations, p. 47.

† This ointment is composed of arsenic, sulphur, the powdered flowers of the ranunculus flammula, and the cotula fœtida, made into a paste with the white of eggs.

‡ Formulaire Pratigue des Hopitaux civiles de Paris, &c. par Ratier. 1825.

the form of pills, with opium or some of the other narcotic extracts, in the dose of one-fourteenth to one-eighth of a grain.

The arseniate of ammonia is an excellent arsenical preparation for medicinal purposes. It may be made in the following way: Dissolve one part of the oxide of arsenic in four parts of nitric acid with half a part of muriatic acid; saturate the solution with carbonate of ammoniæ, and crystallize the arsenic by evaporation. For use, one grain of this salt is to be dissolved in an ounce of distilled water; and of this solution from twenty to twenty-five drops is to be taken at a dose to the amount of a drachm in the course of twenty-four hours. Biett asserts that this is decidedly the best arsenical preparation we possess; and my own experience fully confirms this opinion.

Antidotes.—Sugar and water, or a decoction of linseed and mallows, drank in large quantities, are said to be our best means for counteracting this poison. By taking copious draughts of any of these, vomiting is excited, and the arsenic ejected. Lime-water with sugar has, also, been highly recommended. Orfila states, that "theriac, oil, gall-nuts, the bark of the pine, liver of sulphur, vinegar, suggested by some, ought not to be used, because they are not only useless, but often injurious." In addition to these remedies, warm fomentations and leeches must be applied to the abdomen; general bleeding, promptly and largely employed. When the fever abates the patient should be directed to take veal or chicken broth; and when convalescent, rice-milk, gruel, &c. Wine, spirits, and solid food must be avoided. "Wine, regarded by many persons as proper to restore action, is, in this case, a new poison, which acts precisely as that, the effects of which we have combated. It is only after three or four days

that solid food is to be taken, in small quantities, and such as is of easy digestion."*

Formulæ.

℞.—Solutionis arsen. Fowleri gtt. lx.
Tinct. opii gtt. xl.
Spir. lavend. compos. ʒi.
Aq. cinnamoni ʒiii.—M. Dose, a table-spoonful for an adult; a tea-spoonful for a child.

Asiatic Pills.

℞.—Oxidi arsenici gr. iii.
Pulv. piper. nigr. ℈i.
Conserv. rosar. q. s.—M. Divide into twenty-one pills.
℞.—Oxida arsenici gr. iv.
G. opii gr. vi.
Muriat. ammon. gr. xxiv.
Extract. gentianæ ℈ii.—M. Divide into forty-eight pills. Two pills are to be taken at a dose.

* Orfila.

CHAPTER VII.

II. *Medicines calculated to correct certain morbid states of the system, by acting on the contractility of the muscular fibre.*

ASTRINGENTS.

Astringents are substances that produce constriction or condensation in the living animal fibre. Of the modus operandi in these remedies we know nothing of a satisfactory character. It is certain, at least, that it cannot be explained, as Cullen supposed, on the principle of their action in the process of tanning. It is by producing a *peculiar* excitement in the living, contractile, and irritable fibre, that these substances produce their effects. Further than this general and vague fact, we shall never, probably, be able to go, in our inquiries upon this point.

Various opinions have been entertained, relative to the particular principle which gives to substances their astringency. By some, it has been supposed to be the gallic acid; others have considered it as constituted by an union of this acid with an earthy base; and others again have regarded *tannin* as the astringent principle. That these hypotheses are not entitled to any credit, is evident from the fact, that some of the most astringent substances known, contain neither tannin nor gallic acid. The truth is, that the proximate principle of remedies is just as inscrutable as the *essential* character of the impressions which they produce on

the living system. These are objects which the human mind cannot reach, and about which all our most ingenious speculations are worth nothing.

Astringent substances are applicable to a great variety of remedial purposes. In the treatment of excessive evacuations, especially of hæmorrhages, they have been recommended in all ages. In hæmorrhagy from the nose, lungs, stomach, bowels, and uterus, astringents are, indeed, often of decided utility. They are not, however, to be employed without reference to the state of the general circulation. In what is called active hæmorrhage, where there is tension and force in the pulse, astringents, except, perhaps, the sugar of lead, should never be employed without previous depletion.

In the treatment of dysentery, astringents were formerly much employed. At present, however, their use in the early stages of this disease, is very justly considered as highly pernicious. Cullen was one of the first who spoke decidedly against their employment in this complaint. Although his objections to their use are unquestionably correct, they were not founded upon just views concerning the nature of dysentery. He supposed that this disease depends on an "increased constriction of a considerable portion of the intestinal canal," and concluded, therefore, that astringents must do harm by increasing still more this constricted state of the bowels. The pathology of this complaint is, however, better understood at present, it being well established that it is essentially connected with an inflamed state of the intestinal canal. It is on this account that astringents act perniciously in the early stages of this disease. They not only tend to increase the general inflammatory excitement of the system, but their direct action upon the tender and

irritated surface of the bowels, is calculated to do much mischief, by increasing the local intestinal inflammation. They are further injurious by confining the vitiated and irritating contents of the bowels. After the inflammatory symptoms have been subdued, and proper evacuations made from the bowels, the employment of mild astringents may, sometimes, be resorted to with benefit. As a general rule, however, they are to be regarded as improper, especially in the dysenteries of this climate. In tropical dysentery, as it has been called, astringents are more frequently useful. But even here they require a cautious employment.

In the treatment of diarrhœa, astringents are more generally useful. They are not, however, to be employed, even in this complaint, without some risk of doing harm, when febrile symptoms accompany the disease, or when administered without having previously unloaded the bowels of their vitiated contents, by proper purgatives. When given without these precautions, they are apt to give rise to colic, headache, and other unfavourable symptoms. When the disease is protracted, and no signs of a phlogistic tendency be present, we may, in general, use astringents with advantage. In cases of this kind I have found very minute doses of calomel, given in union with some vegetable astringent, exceedingly useful.

Astringents are, also, much employed in leucorrhœa. In that form of the disease which Dr. Darwin calls the *fluor albus frigidus*, these remedies are sometimes beneficial. When there is much febrile action connected with the complaint, they are, however, universally injurious. The usual and best way of employing astringents in this disease, is in the form of injection. They are not unfrequently, also, given internally; but it does not appear that they are capable of doing much

good when thus employed. In using astringent injections in this complaint, we should take care that we adapt the strength of the injection to the degree of sensibility and irritation in the affected parts. Where there is considerable *ardor urinæ*, with other marks of a phlogistic state of the internal surface of the vagina, the astringency of the injections should be very weak, and employed for the purpose rather of washing away the irritating secretions, than with a view to arrest the discharge by an impression made on the parts affected.

The employment of astringent injections in gonorrhœa, is exceedingly common. Many writers, however, reprobate their indiscriminate use in this complaint, and there can be but little doubt, that much mischief is often done by their employment. During the early or more inflammatory stage of the complaint, they can never be useful, and seldom fail to do harm. The consequences which may result from their imprudent use are, chordee, hernia humoralis, stricture, violent inflammation in the urethra and neck of the bladder, phymosis, &c. After the discharge has continued for some time, and the general as well as local inflammatory action has been reduced by antiphlogistic measures, mild astringent or stimulating injections are of unquestionable utility. Too little attention, however, is commonly paid to general remedies in this affection. Bleeding, saline purgatives, and a low diet, are of essential service in the early stage of the majority of cases of this kind. By these measures, and the liberal employment of balsam copaiva, we may, for the most part, cure the disease speedily and safely.

Astringents are, also, much used as external applications to inflamed parts. In ophthalmia they may often be employed with great advantage. In this, however, as in the former complaint, they may, also, produce

much mischief, by being applied during the early or active stage of the inflammation. When the local and general inflammatory action has been reduced by proper antiphlogistic means, moderately astringent collyria are generally very serviceable. In aphthous ulcerations of the mouth and throat, or in inflammation or relaxation of the palate and tonsils, astringent gargles are much employed. In prolapsed parts, as of the uterus and anus, also, astringent injections are often of great service.

Some writers have supposed that astringents possess the property of relieving the symptoms of urinary calculi. This opinion is certainly countenanced by the beneficial effects which *uva ursi* produces in affections of this kind. But it would appear that the antilithic powers of this substance do not reside in its astringency, since we know of no other astringent that possesses any obvious powers in this way.

The class of astringent substances is very numerous. The property of astringency is especially common in the barks and roots of vegetables. The mineral astringents are, generally, much more powerful than those which are obtained from the vegetable kingdom. The majority of the latter are connected with other active properties; the former are, for the most part, purely astringent, or astringent and tonic.

CORTEX QUERCI.

The genus quercus is a very extensive one, and the barks of all its different species possess more or less astringency. That which is employed in medicine is chiefly obtained from the black oak, (*Quercus tinctoria*, Mich.) although some of the other species of this

family furnishes us with barks, equally, if not more astringent. The late professor Barton was of opinion that the chesnut and Spanish oak barks (*Q. monticola*, *Q. falcata*,) are preferable, in most cases, to the black oak bark; he asserted that they possess all the useful properties of the *tinctoriæ* in a superior degree, without partaking of the purgative quality of the latter.*

Oak bark contains a very large proportion of *tannin*, which is readily extracted by infusion. It appears from the experiments of Mr. Davy, that the proportion of tannin varies according to the age of the tree from which the bark is taken; the younger containing more of this principle than the older bark.

The oak bark was very early employed in medicine. Galen recommended a decoction of the leaves and outer bark of the oak in dysentery, uterine and pulmonary hæmorrhages, and in fluxus cœliacus.† It is undoubtedly one of the most powerful vegetable astringents we possess; and capable, as such, of being applied to very useful purposes in medicine. In the treatment of intermittent fevers it has been recommended as a remedy of very considerable efficacy.‡ I have known it to be given in this disease with prompt success; it is, however, exceedingly disgusting to the taste, and few patients can be induced to take it. In the intermittents of very young children, I have, in a few instances, used the oak bark decoction, as a bath, with benefit. But there are other indigenous barks of superior efficacy in this respect, and they do not, like this one, give so disagreeable a dye to the skin. In chronic diarrhœa, this bark has been found very serviceable. Its employment

* MS. Lectures on Mat. Med.

† Alibert, Nouv. Elem. de Therap. vol. i. p. 93.

‡ Dr. Rousseau, Philad. Med. Museum, vol. ii.

in dysentery is, however, very objectionable, except, perhaps, in the last stage of very protracted cases. As an injection in leucorrhœa, the infusion of oak bark has been much recommended by some writers, and I have myself employed it in this way with very good effects. It is, also, a useful application in inflammation and swelling of the fauces, prolapsus uvulæ, and cynanche tonsillaris. "In many cases," says Dr. Cullen, "this decoction, early applied, has appeared useful in preventing those disorders. I have, indeed, almost constantly joined a portion of alum to these decoctions; but I have frequently found that a solution of alum alone, of the strength it could be conveniently employed in, did not prove so effectual.

Bathing in a decoction of black oak bark has, also, been recommended as an efficacious remedy in tabes mesenterica. Dr. J. Fletcher, of Virginia, has reported four cases of this disease which yielded readily to purgatives, together with bathing twice a day in a strong decoction of this bark.* The inhalation of the finely powdered oak bark has been known to produce very excellent effects in pulmonary consumption. An instance of this kind was communicated to me some years ago by Mr. William Webb, of Lancaster county. He informed me that a man who had laboured under the usual symptoms of confirmed phthisis, was advised to employ himself in grinding bark for a tanner in his neighbourhood. He was extremely weak and emaciated when he went into the bark-mill; in a short time, however, the cough, night sweats, and other hectic symptoms began to abate, and in less than three months he was perfectly restored to health.

The powdered oak bark, in the form of a poultice, is an excellent application to mortified or gangrenous

* Am. Med. Recorder, vol. iii. p. 363.

parts. Dr. Barton employed it both internally and externally with great success, in a case of gangrene of the foot.*

Mr. Lizars has recently published some observations on the efficacy of oak bark in the cure of reducible hernia, in which he declares that he has used it with "wonderful success."† He directs it to be used in the following manner:—a strong decoction is to be made by boiling a few pounds of the bark over a gentle fire for two or three days, adding a little boiling water from time to time, so that the bark may be always covered. This decoction is to be strained and evaporated to the consistence nearly of an inspissated juice. Previously to using this inspissated decoction, it should be warmed in order to suspend the astringent matter. The hernia having been reduced, the groin is to be bathed with the decoction three or four times a day, and the truss applied. Mr. Lizars states, that he has cured hernia of many years standing in the course of a few weeks.

It may be observed that the use of oak bark for the cure of hernia is by no means a new practice. Desessarts employed the powdered bark for this purpose more than fifty years ago.‡ He put it into small muslin bags which he moistened with wine, and laid on the groin under the pad of the truss, having previously returned the hernia. He affirms that it seldom required more than a few weeks to perform a perfect cure in children. In the 35th number of the Gazette Salutaire, the efficacy of a strong decoction of this bark in hernia is strongly insisted on;§ and Kæmpf, a writer of great

* Collections towards a Mat. Med. of the United States, p. 11.

† Edinburgh Medical Journal, No. 72.

‡ Gardane, Gazette de Sante, 1775.

§ Richter's Chirurgische Biblioth. B. iv. p. 25.

respectability, says, that the good effects of the oak bark in the cure of hernia cannot be too highly praised.*

For internal use an ounce of the powdered bark is to be boiled in two pints of water down to one pint. The dose of this is from one to two ounces.

The leaves and cups of the acorns differ very little in astringency from the bark. The acorns possess more of the bitter principle, and on being roasted, evolve a considerable portion of an empyreumatic oil. These have been highly recommended in tabes mesenterica.† They are, also, said to be very serviceable in spasmodic cough, asthma, chronic hysteria, amenorrhœa,‡ diarrhœa, and rheumatism. They are given to the extent of from one to two ounces daily. They are used, by some, as a beverage instead of coffee.

Formulæ.

℞.—Cort. querci ℥iv.
Aq. fontanæ ℔iv. coque ad reman. ℔ii. colat. adde
Sulphat. aluminis ʒiss.—M. This forms an excellent injection in leucorrhœa; and may be beneficially used as a gargle in relaxed uvula.

℞.—Pulv. cort. querci ʒi.
—— rad. serpentaria ʒii.
—— —— rhæi. ʒss.
Super carbonat. sodæ ʒi.—M. Divide into eight equal parts. One every two hours—in intermittents.

GALLÆ.

The gall-nuts of commerce are obtained from the quercus cerris, a species of oak indigenous to Asia Minor, "from the Bosphorus to Syria, and from the

* Von einer neuen methode die hartnæckigsten krankheiten zu heilen, &c. p. 382.

† Kaiser von dem Nutzen der Eicheln in der dörrsucht der kinder. Frankfort, 1784, 8.

‡ Marx, Greschichte der Eichlen, &c. Burdach's Arzneimittellehre, tom. iii. p. 564.

shore of the Archipelago to the frontiers of Persia." It is also found growing in the southern countries of Europe. The galls are excrescences from the young shoots of this tree, and are produced by the puncture of an insect (diplolepis gallæ tinctoriæ) to deposit an egg. They are nearly round, and studded with a number of rough wart-like tuberosities. They are hard, and when broke exhibit a smooth or flinty fracture. They have no odour, but are extremely astringent, and bitter to the taste. Both water and alcohol extract their active principles. According to Neumann's experiments, water extracts seven-eighths of their substance, alcohol a little more than seven-eighths.* The chemical composition of galls does not appear to be as yet perfectly ascertained. Sir H. Davy obtained from five hundred grains of Aleppo galls, one hundred and thirty grains of tannin, twelve of mucilage and matter, rendered insoluble by evaporation, thirty-one of gallic acid, and a little extractive matter, and twelve of calcareous earth and saline matter.

Besides these component parts, it appears, from the experiments of M. Braconnot, that the gall-nut contains a peculiar acid, distinct from the gallic acid, and to which he has given the name of *ellagic acid*.† The infusion and tincture of galls strike a black precipitate with iron. The precipitate formed by the acetate and subacetate of lead is grayish; that by tartarized antimony, yellowish; by sulphate of copper, brown; sulphate of zinc, reddish-black; nitrate of silver, deep olive; and nitrate of mercury, bright yellow.‡ Concentrated sulphuric acid produces a copious milk-white curdy precipitate, which soon becomes brown, and as-

* Chemica Media, vol. ii. p. 2.

† Annales de Chimie, vol. ix. p. 187, new series.

‡ Paris's Pharmacologia.

sumes the appearance of a resinous substance. This precipitate is soluble in alcohol and boiling water. It consists of tannin and extractive matter, and is powerfully astringent. Nitric acid destroys the astringency of the infusion, but does not produce any precipitate; muriatic acid forms a white flaky precipitate. The carbonate of potass produces a similar white precipitate, which consists of tannin, lime, and potass, and destitute of astringency. It is but very sparingly soluble in water and alcohol. Lime-water occasions a precipitate of a dark green colour. Animal jellies and starch precipitate the tannin from the infusion.

Galls are a very powerful astringent, and may be usefully employed in cases where such remedies are indicated. They were at one time a good deal prescribed in the cure of intermittents, but it does not appear that they possess sufficient febrifuge power to entitle them to much attention in this respect. M. Poupart has made a favourable report on this subject in the memoirs of the French academy for the year 1702; but according to Bergius, galls are very pernicious when employed in this disease. Cullen, however, states that they produce no bad consequences when given with gentian or other bitters.*

The infusion of galls has been recommended as a very useful injection in leucorrhœa and in gleet. In chronic diarrhœa, also, we may often derive much advantage from this remedy when prudently administered. In ulcers, or inflammation of the palate, tonsils, or gums, and in relaxation of the uvula, the infusion forms an excellent astringent gargle.

An ointment made of one part of finely powdered galls to eight of lard, forms a very useful application in hæmorrhoidal affections. In internal piles the de-

* Mat. Med. vol. ii. p. 34.

coction has been injected into the rectum. Such a practice is, however, not to be rashly imitated. The sudden suppression of hæmorrhoidal discharges, by applications of this kind, has been often productive of very serious consequences; epilepsy, apoplexy, phthisis, and other dangerous affections have been induced in this way. Where the discharge has not as yet become habitual, and is very profuse, the employment of astringent injections may often be resorted to with advantage. As a general rule, however, the practice is not to be recommended. In prolapsus ani and uteri, injections of the infusion of galls are generally very useful.

Formulæ.

℞.—Gallarum. contusar. ℥i.
Aq. bullientis ℥vi.—Infuse for four hours, strain and add,
Cretæ preparat. ℥ss.
Tinct. opii ʒi.
G. arab. ℥ss.—M. Dose, a table-spoonful every two or three hours, in diarrhœa.

℞.—Pulv. galarum. ʒi.
—— camphoræ ℈i.
—— opii gr. x.
Adipis suillæ ℥i.
Misce. ft. unguentum.—Used in hæmorrhoidal affections.

GERANIUM MACULATUM.

The geranium maculatum, or spotted cranesbill, grows abundantly in almost every section of the United States. The root, which is the only part used for medicinal purposes, is thick, rough, and knobby. Externally the dried root is of a dark brown, and internally of a pale flesh colour. It is one of the most powerful and pure vegetable astringents with which we are acquainted. According to professor Bigelow's experiments, it contains a considerable proportion of

tannin, and some gallic acid. "The gallic acid is indicated by the dark precipitate remaining in solution. It differs, however, from the acid of oak galls in not reddening vegetable blues, and not passing over in distillation."* Its active principles are readily extracted both by alcohol and proof spirits. The tincture is strongly astringent.

This root is the most agreeable astringent we possess. Its astringency is not associated with bitterness or any other unpleasant taste. In the diseases of children, where astringents are indicated, a decoction of it in milk, is a very convenient and efficacious remedy. In this form it has been a good deal used in cholera infantum, and I have myself repeatedly prescribed it, in protracted cases, with great benefit. I have, also, administered the powdered root in union with calomel, in the proportion of gr. vi. of the former to one-sixth of a grain of the latter, with much advantage in this affection. In the advanced stages of diarrhœa and dysentery, after proper evacuations have been made, it has proved very beneficial. In my own practice I have occasionally given it in cases of this kind with very good effects. I have, also, used the watery infusion as an injection in gonorrhœa, but not with any decided benefit. In aphthous affections of the mouth this remedy is frequently very useful. In a chronic and very obstinate case of ulceration of the mouth the patient was perfectly relieved by the use of gargles made of this root, after a great variety of other substances had been tried unsuccessfully by myself and others. Dr. Mease recommends it as very efficacious in restraining internal hæmorrhages; and Dr. Thacher says, that he has known the infusion to restrain

* Bigelow's American Medical Botany, vol. i. p. 89.

hæmorrhage from the lungs in a very prompt manner. It is said that the western Indians consider the geranium as the most effectual remedy they have for the venereal disease.

From considerable experience with this medicine, as well as from the testimony of many other physicians, I am entirely satisfied that it is one of the most useful vegetable astringents we possess. The saturated tincture may be given in doses of from one to two drachms. In substance it may be given to the extent of thirty or forty grains.

OROBANCHE VIRGINIANA.

The orobanche virginiana, or beech drop, is a parasitic plant, growing almost exclusively on the roots of the beech tree. It is herbaceous, from six inches to a foot in height, and commonly of a pale yellow colour. The root is tuberous, clay-coloured, and covered on its lower part with a number of small fibres. The stem is erect and furnished "with short ovate scales instead of leaves, of which it is entirely destitute."

The root of this plant is powerfully astringent, and has been frequently employed as such in the practice of some of our physicians. It entered as an ingredient into the famous cancer powder of Dr. Martin; and Dr. Barton observes, that "it has been of great service, externally applied, to obstinate ulcers, some of which had resisted the applications that are commonly made use of in such cases." In aphthous ulcerations of the mouth I have known it to be highly beneficial. I have, also, used a strong decoction of this root as a wash in an obstinate cutaneous affection of the herpetic kind, with complete success. Internally I have never employed

it; I do not doubt, however, of its applicability to all the purposes for which vegetable astringents may be useful. In some parts of this country it is a common remedy for diarrhœa and dysentery.

HÆMATOXYLON CAMPECHIANUM.

This tree, which furnishes the logwood of commerce, is a native of South America, and is particularly abundant in the province of Honduras, whence it was brought into Jamaica, where it now grows very plentifully. The wood is compact and heavy, and of a deep red colour internally. When split open it has a peculiar sweetish odour. Its taste is sweet, followed by a slightly bitter astringency. The colouring matter of logwood may be obtained in a separate state, in the form of small brilliant crystals of a reddish white colour, and of a sub-astringent, bitter, and acrid flavour. This crystalline substance has recently received the name of *hematin*. The infusion of logwood is of a deep blood red colour. By adding to it the sulphate of iron it becomes black; the solution of the sulphate of alumine changes it to a purple colour, which by the admixture of some potass assumes a fine violet hue.* The oxydulated sulphate and nitrate of iron change the blood red decoction to a very beautiful dark blue. Carbonate of iron strikes a dull black precipitate, leaving a brown supernatent fluid. Muriate of tin forms a light and loose red precipitate with both the decoction and infusion, leaving the fluid as clear and colourless as water. Phosphate of lime renders the colour somewhat more light, and forms, after some time, a dark

* Dissertatio de Hæmatoxylo Campechino. Vide Pfaff's System der Mat. Med. t. ii. p. 213.

brown precipitate. The alcoholic tincture is of a dark yellowish red colour, possessing the same chemical habitudes as the watery infusion. Water distilled from logwood remains perfectly clear, but acquires the peculiar odour of the wood.

When the decoction is taken internally it very soon gives a deep red colour to the urine. By some practitioners it has been recommended as a very efficacious remedy in dysentery and diarrhœa. Dr. John Hunter asserts that he found the extract of logwood very serviceable in cases of dysentery where the discharges were frequent and copious, and not attended with much tormina.* It has, also, been used with advantage in the chronic form of cholera infantum,† and I have known it to be given with excellent effects in a case of diabetes.

The best form for exhibiting this remedy is an infusion. A cup-full of this may be taken every three or four hours. The extract is, also, frequently employed. It may be given in doses of from twenty to thirty grains.

RUBUS VILLOSUS.

The bark of the blackberry root is a pure and powerful astringent, and is now a good deal employed as such, both in popular and in domestic practice. The sulphate of iron changes the colour of both the infusion and decoction into a beautiful dark purple, and occasions a copious precipitate. Gelatin, also, produces a copious white and opake precipitate. The alcoholic solution undergoes a partial decomposition on adding

* Treatise on the Diseases of Jamaica, p. 186.

† Dr. Chapman's Therapeutics and Mat. Med. vol. ii. p. 270.

water to it. The precipitate thus formed is of a flocculent appearance, and when dry "exhibits the common resinous properties on exposure to heat."*

This root has been much extolled by some late American writers for its efficacy in the cure of chronic dysentery, diarrhœa, and cholera infantum. I have myself employed it with advantage in the latter complaint. I prefer, however, using the geranium maculatum, as being much more pleasant to the taste. I have seen an infusion of the blackberry root used in a case of hæmatemesis with apparent advantage. I have, also, known it to be used with very good effects as an application in the form of a cold poultice, in hæmorrhoidal tumours. As an astringent, this article may, no doubt, be usefully employed, wherever such remedies are indicated.

The berries of this bramble have also been used in medicine. Dr. Mease says, "a jelly made of blackberries when on the turn from red to black, is much used in the United States for gravel. It has been said that a decoction of the root of this plant is very useful in gravelly complaints. I am not aware, however, that there is any foundation for this opinion.

KINO.

This is an inspissated vegetable juice, possessing very great astringency. The natural history of the trees from which it is obtained is, as yet, but imperfectly known. The kino of commerce consists of three distinct kinds: "The first is in very small jet-black fragments, perfectly opaque, without smell, crackling under the teeth when chewed, not colouring the saliva, after some time imparting only a slight astringent taste, not fusible, and diffi-

* Bigelow's American Medical Botany, vol. ii. p. 163.

cultly reduced to powder." There is another kind which consists of large pieces, of a very dark-brown colour, resinous appearance, and interspersed with little air cells; very thin pieces of it are translucent, and of a ruby red colour; when chewed it crackles under the teeth; its taste is at first slightly acid, which soon changes to a very bitter and astringent one, "succeeded by a peculiar sweetness. It is infusible, and forms a reddish brown powder." This variety of kino is obtained from the juice of the coccoloba uvifera. There is a third variety of this substance, which consists of dark brown pieces of different sizes. It is generally covered with a reddish brown powder, has a resinous and unequal fracture, and is often mixed with bits of leaves, twigs, &c. Very thin pieces are transparent; it crackles but slightly under the teeth, and its taste is astringent, followed by sweetness. This variety is obtained from the eucalyptus resinifera, a tree indigenous to New South Wales.* "The London College," says Dr. Duncan, "have indicated the butea frondosa as the source of kino, but certainly erroneously." It, however, produces, in large quantities, a red juice very analogous to kino, and which may unquestionably be used as a substitute for it. The production of these substances from so many different trees in Africa, America, Asia, and New Holland, show that kino is to be considered as a genus of which these are species.

Kino contains a very large proportion of tannin, and does not possess any of the characteristic habitudes of the resins or gum-resins. According to Vauquelin's analysis, one hundred parts of kino consist of seventy-five of tannin, twenty-four of red mucilage, and one of fibrous matter.† Cold water dissolves about four-fifths

* Dr. Duncan's Dispensatory.

† Ann. de Chimie, tom. xlvi. p. 321—332.

of its substance; but in hot water it is much more soluble; and hence the decoction, on cooling, lets fall a copious reddish brown sediment, and becomes turbid. Alcohol dissolves the whole of this substance, except its impurities. "It is remarkable, says Dr. Duncan, "that alcohol dissolves kino entirely, but does not dissolve the residuum of the decoction." The solutions of kino form a grayish yellow precipitate with acetate of lead,—a reddish yellow one with nitrate of silver, a yellowish white one with tart. antimon.—and a green one with sulphate of iron. Gelatine, also, precipitates the solution of kino.* By exposure to heat kino becomes soft, and if the heat is very considerable, it slowly enters into fusion.

This substance was first introduced to the notice of the profession as a useful remediate article, by Dr. John Fothergill, about eighty years ago.† It has been recommended as an efficacious remedy in intermittent fevers, given either by itself or in conjunction with some of the bitter tonics. In the advanced stages of diarrhœa, and in chronic dysentery, it is very frequently employed; and I do not doubt that it will generally answer all the useful purposes in these complaints, that can be obtained from astringents. In the bowel complaints of children, especially, it may often be very advantageously given in union with chalk and small portions of laudanum. The aqueous solution of kino has been highly recommended as an injection in the cure of fluor albus and gonorrhœa. In the former of these complaints a solution of this substance in lime-water, is said to be particularly useful. Its use in this

* Pfaff's Mat. Med. tom. ii. p. 200.

† A letter from Dr. John Fothergill to the Medical Society, concerning an astringent gum brought from Africa. See Med. Observ. and Inquir. vol. i. p. 358.

way is objectionable, however, on account of its staining every thing with which it comes in contact, of a blood red colour. It has, also, been employed with good effects in diabetes; and Pemberton speaks very favourably of its virtues in pyrosis. Some practitioners have found it to produce excellent effects in certain varieties of hæmorrhage, more especially in protracted menorrhagia, from laxity of the solids. Gillespi recommends a solution of kino in red French wine, an excellent application to foul scorbutic ulcers.*

Kino is given in substance, in doses of from ten to thirty grains. It is also very frequently given in the form of tincture; from twenty to forty drops of which may be administered for a dose.

Formulæ.

℞.—Tinct. kino
—— ipecac. āā ℥ss.
—— opii ℥ii.—M. Take from thirty to forty drops every two or three hours. This is an excellent mixture in chronic dysentery and diarrhœa.

℞.—Pulv. kino gr. xxvi.
—— opii gr. ii.
Mucilag. g. arab. q. s.—M. Divide into ten pills. Take two every three or four hours—in diarrhœa, &c.

CATECHU EXTRACTUM.

The tree, *mimosa catechu*, which furnishes this extract, is a native of Hindostan, and is said to be particularly abundant on the uncultivated mountains of Rotas and Pallamou, in the province of Bahar, westward of Bengal.† Catechu is, however, also obtained from other species of mimosa; and at Bombay it is principally prepared from the nuts of the areca catechu.

* London Med. Journ. vol. iv. p. 373.

† For a good account of the tree producing the catechu, and of the mode of preparing this substance, see Med. Obs. and Inquir. vol. v. p. 148.

The catechu obtained from the mimosæ, is prepared from the internal part of the wood by decoction, and evaporation in the sun.

This substance comes to us in compact, hard, brittle, flat pieces, of a dark brown colour; and, when broken, exhibiting light and dark brown streaks. It possesses a powerfully astringent taste, succeeded by a slight sensation of sweetness in the mouth. It has no odour. Its specific gravity varies from 1.28 to 1.39. Formerly it was thought to be a mineral product, and was, therefore, described under the improper name of *terra japonica*. Hagedorn and Boulduc* were among the first who opposed this error, and who established the fact of its vegetable origin. According to Mr. Davy's analysis, two hundred grains of Bombay catechu contains one hundred and nine grains of tannin, sixty-eight of a peculiar extractive matter, thirteen of mucilage, and ten of residual matter. Bostock found traces of gallic acid in catechu. That which is brought from Bengal contains less tannin. It is almost wholly dissolved both by water and proof spirits. The oxysulphate of iron produces a beautiful green precipitate with the aqueous solution of this substance, which changes to an olive green, with a faint shade of brown, by the further addition of some muriate or nitrate of iron. Lime, barytes, and strontian produce copious light brown, and the preparations of copper dark brown precipitates. It also forms a copious precipitate with gelatine. The concentrated muriatic and sulphuric acids produce pale precipitates, and the fuming nitrous acid destroys its property of precipitating the solutions of lime and iron.

The catechu was formerly much employed by physicians, and it is unquestionably an article of strong and

* Mém. de l'Acad. des Sciences de Paris. A. 1709, p. 228.

useful astringent powers. In diarrhœa and the advanced periods of dysentery, it is equal if not superior to any of the vegetable astringents we possess. It is also said to be a very valuable remedy in fluor albus, when employed in the form of an injection. Combined with gentian it has been used with success in obstinate intermittents.* In relaxation of the uvula, and ulcers of the mouth and fauces, it has been known to produce very excellent effects. It has, also, been prescribed with much advantage in general relaxation of the system with debility of the digestive organs.

Clysters of a solution of catechu have been recommended as highly useful in restoring tone and energy to the bowels in cases of colica pictonum.† Mr. James Kerr states, that this substance forms a principal ingredient in an ointment of great repute among the Hindoos, composed of sulphate of copper ʒiv. catechu ℥iv. alum. ix. white resin ℥iv. reduced to powder and mixed with olive oil and water sufficient to bring the mass to the consistence of an ointment. This ointment they use in all kinds of ulcers. "A gentleman," says Mr. Kerr, " of great practice, told me he used this ointment with success beyond expectation."‡

The catechu is administered both in the form of a powder and of tincture. The former is given in doses of from grs. x. to ϑi. The latter from thirty to sixty drops. It is, also, occasionally prescribed in the form of an electuary and in lozenges. The latter by gradually dissolving in the mouth, may be very conveniently and beneficially used in relaxation of the palate and fauces.

* Dr. Barton, in a note to Cullen's Mat. Med. vol. ii. p. 31.

† Chirurg. Arzneimittellehre, Von C. L. Römer, B. i. s. 119.

‡ Medical Obs. and Inq. vol. v. p. 158.

Formulæ.

℞.—Catechu ʒss.
G. arab. ʒi.
Pulv. aluminis ℈ii.
Aq. menth. pip. ʒiv.
Vin. alb. generos. ʒii.—M. Dose, a table-spoonful every two hours.

℞.—Pulv. ipecac. ʒss.
—— catechu ʒi.
—— opii gr. iii.
Sacch. albi. ʒi.—M. Divide into twelve equal parts. Take one every two or three hours.

SUPERACETAS PLUMBI.

The acetate or sugar of lead consists of irregular masses resembling lumps of white sugar, "being an aggregation of acicular four-sided prisms, terminated by dihedral summits." Its taste is sweet and styptic. When exposed to the air it slightly effloresces, and is decomposed by heat and light. It is soluble in twenty-five parts of water, and also in alcohol. The aqueous solution is turbid and of a milky colour, but becomes transparent on adding a small portion of acetic acid to it. It is decomposed by the "alkalies, alkaline earths and their carbonates, most of the acids, alum, borax, the sulphates and muriates, soaps, all sulphurets, ammoniated and tartarized iron, tartarized antimony, undistilled water."

When taken internally the sugar of lead produces a sensation of constriction on the fauces and along the whole course of the œsophagus. It accelerates the frequency of the pulse, but does not augment its strength or volume.*

The effects of the continued influence of lead on the

* Semmes' Inaugural Thesis, on the Effects of Lead, &c. Philad. 1801.

animal body, are of a nature so distressing and dangerous, that it was long before physicians would venture on the internal employment of the saturine preparations. We find, however, that the sugar of lead was occasionally used as an internal remedy as early as the days of Paracelsus. This eccentric genius extolled it as a remedy of great powers in diseases of the thoracic viscera, all of which he included under the general name of asthma.* Its internal use was, also, strongly recommended in all species of dropsies, by Goulard; and Wuerz and Gramannus, of the sixteenth, and Libavius, Raumer, and others, of the seventeenth centuries, employed it freely as an internal medicine. The use of lead in this way, was, however, strongly opposed by Stahl, Hoffmann, Boerhaave, and subsequently by Sir G. Baker,† and the authority of these names proscribed almost wholly, for a time, its internal employment. But the apprehensions of the profession, in this respect, gradually gave place to the accumulating testimony of experience in favour of its general inoffensiveness; and it is now pretty commonly admitted, that, although not destitute of deleterious properties, the sugar of lead may be exhibited internally in a variety of affections with great benefit and without the least injury, if managed with prudence and judgment. It must be confessed, however, that this remedy has been known to produce injurious effects even under the most judicious administration; and we are, therefore, not to resort to it with an entire assurance of its being uniformly innoxious. Like all our heroic remedies, it is capable of doing a great deal of good, and,

* Paracelsi Opera Omia, vol. ii.

† Medical Transactions of the London College of Physicians, vols. i. and ii. 1772.

also, under unfavourable circumstanees of administration and constitutional predisposition, much harm.

The sugar of lead was very early recommended as a useful medicine in phthisis pulmonalis. The Pharmacopœia Batena contains the formula of a tinctura anti-phthisica,* into which sugar of lead enters as a principal ingredient, and which is stated to be "truly a good medicament in those consumptions which proceed from ulcers of the lungs."† Ettmuller, also, employed the sugar of lead internally in this disease. More recently this remedy has been particularly recommended in this affection by Horn,‡ Amelang,§ Remer, Kopp,‖ Hildebrand,¶ Jahn,** and others. Ossiander (Entwicklungs Kraneiten, B. ii. p. 147) is a zealous advocate for the employment of this article in phthisis. He asserts, that in a great many cases he derived unequivocal benefit from its employment, and in some instances, the disease, he affirms, yielded completely to its sanative powers. It is said to be particularly beneficial in cases attended with a copious purulent expectoration; and in that variety of consumption which depends on chronic inflammation of the mucous membrane of the bronchia. Ossiander gave the acetate of lead in union with opium, or with the extract of cicuta. Horn relates the history of a case of phthisis pulmonalis, in which the sugar of lead was given in gradually increased doses until the quantity taken

* ℞.—Sacch. saturn. ʒii.
Sal. martis ʒi.
Inf. spir. vin. ℔bi. Dose from twenty to forty drops.

† Pharmacopœia Bateana, or Bates's Dispensatory, fourth edition, by William Salmon, M. D. 1693.

‡ Horn's Archiv. fur Medicinische Erfahrung, 1812, tom. i.

§ Hufeland's Journal of Pracktischen Heilkunde, tom. xxii. p. 3.

‖ Ibid. tom. xi. p. 62.

¶ Hufeland's Journal of Pracktischen Heilkunde, tom. viii. No. 4, p. 3.

** Materia Medica, p. 2.

during the day amounted to eighteen grains. The patient's health was, finally, entirely restored by the continued use of this remedy. (Archives f. Med. Erfahr. 1808, B. vii.) Hufeland also employed this article with success in a case of catarrhal consumption; and in addition to the names already mentioned in testimony of its valuable powers in this disease, we may cite, also, those of Greiner (Allgem. Med. Annal. 1811), Kopp, Herschberg (Hufeland's Jour. Bd. xxxi. St. 5); Wolfe (Ibid. Bd. xxxiv.); Amelang (Ibid. Bd. xxii.); Latham (Med. Transact. vol. v. 1815); Wesener (Hufeland's Jour. B. liii.); Fauquier, Lentz, and Weber (Grund zuge d. Consumptions Krank. d. Lunenorg, &c., 1823.) I have myself, in a few instances, given it in this disease, and its effects were always manifestly beneficial. It generally lessens both the night-sweats and expectoration, and often very considerably relieves the cough. It is especially useful as a palliative in the advanced stage of the complaint, when the patient is harassed by frequent colliquative discharges from the bowels.

To check internal hæmorrhages the sugar of lead is, undoubtedly, the most efficacious remedy we possess. It was occasionally resorted to in cases of this kind by the older physicians, but its virtues in this respect have only become duly appreciated during the last twenty or thirty years. The efficacy and safety of the sugar of lead in hæmorrhages, rests now upon the evidence of a very extensive experience. Monro, Hill, Reynolds, Barton, Amelang, Williamson, Jahn, Richter, Heberden, and many others have written in favour of its employment in such affections. It appears to be equally applicable to the treatment both of active and passive hæmorrhages. When, however, the pulse is full and hard, bleeding is obviously an essential preliminary to

the use of the lead. The late Dr. Barton was in the habit of prescribing this remedy in combination with small portions of opium or ipecacuanha. "Seldom," says he, "have I been disappointed in my expectations of benefit from this medicine, which, of all the articles of the materia medica, seems to me to possess the greatest command over the movements of the arterial system." From my own experience with this remedy, in hæmorrhagy, I am induced to entertain a very high opinion of its powers. In a single instance only have I known its use to be followed by symptoms of colic, and these readily yielded to a few doses of castor oil and opium.

The sugar of lead has also been recommended in the cure of dysentery and diarrhœa. To this purpose it appears to have been very early applied, as we find it mentioned by several of the older writers,—particularly by Ettmuller and Adair, who speak highly of its remediate powers in dysentery. Drs. Moseley and Jackson have also added their testimony in favour of its usefulness, under certain circumstances, in this disease. "In chronic dysentery," says Dr. Jackson "a solution of sugar of lead, viz. ten grains of the acetate to one drachm of the crystals of tartar, and two parts of boiling water, given every three or four hours, to the quantity of two ounces for a dose, gives evident relief on many occasions, and in no instance within my knowledge has any inconvenience arisen from the supposed deleterious effects of the lead."* Moseley employed this substance in the form of enemata, where the tenesmus was inveterate and harassing, attended with frequent discharges of bloody mucus, or purulent matter, and great soreness about the anus.† Dr. Bampfield, another late writer

* Jackson on Febrile Diseases, vol. ii. p. 61.

† Moseley on Tropical Diseases, p. 404, fourth edition.

on tropical diseases, states that Dr. Ainslie, at the artillery hospital at the Mount of Madras, showed him cases "where this medicine was said to be strikingly useful." He does not, however, add much in favour of this remedy from his own experience. He says, that during its exhibition animal food should be abstained from.* Quite recently, Dr. Harlan, of this city, has published cases illustrative of the efficacy of this medicine in dysentery,† and he seems to entertain a very high opinion of its powers, as well as an entire conviction of its safety. My own limited experience with this article, in dysentery, has by no means been satisfactory. I have found it in a few instances to produce constipation with a distressing pressing down of the bowels, without affording any relief to the tormina. I have no doubt, however, that cases may occasionally occur in which the sugar of lead will be found advantageous. But, as a general practice, I am not disposed to think favourably of the remedy.

Of the employment of sugar of lead in intermittents I know nothing from my own experience. Some writers of the last century have spoken well of it in this disease, but I suspect that its powers in this respect are not entitled to much attention. In some of the neuroses this article has been found decidedly beneficial. Saxtorph,‡ Richter,§ Ossan,‖ and others employed it with success in epilepsy and hysteria. Dr. Rush,** also, cured a case of epilepsy with this remedy; and in the New York Medical Repository,†† I have reported a

* Practical Treatise on Tropical Dysentery, p. 198. London, 1818.
† American Medical Recorder, vol. v.
‡ Act. Reg. Soc. Med. Hafniensis, vol. iii. 1792.
§ Specielle Therapie, vol. vii. p. 266.
‖ Osann. Dissertatio de saturni usu Medico, maxime interno, 1809.
** Philadelphia Medical Museum, vol. i. No. 1.
†† Vol. ii. No. 1, New Series, 1813.

remarkable case of this disease, in which the sugar of lead proved completely successful. In this case the fits returned regularly about the periods of full moon. I prescribed three grains of the sugar of lead to be taken mornings and evenings, commencing three or four days before the expected return of the paroxysms, and continued it for five days at each period. The medicine was thus taken at five successive periods of full moon, and the patient who had been affected with the disease upwards of eight years, was permanently cured thereby.

The sugar of lead has also been prescribed in other spasmodic diseases. Kramp, a German writer, cured a case of spasmodic dysphagia by it, and Ettmuller employed it in melancholia, in which he says "it is esteemed a specific."* It is said, also, to have been given with advantage in tetanus.† Lately this remedy has been highly spoken of in the cure of hooping-cough. I have used it in five or six cases of this disease, and in a few instances it appeared to do some good. Its efficacy in this respect is, however, not sufficiently great to entitle it to much attention, and more especially as its employment can certainly not be said to be without some risk of unpleasant consequences.

The sugar of lead is one of the most useful remedies we possess for the reduction of external phlegmonous inflammation. In ophthalmia it has long been an exceedingly common remedy; and, although applications of this kind are by far too indiscriminately made, it may often be resorted to with great benefit. When the inflammation does not depend on a constitutional cause, and is unaccompanied by much excitement of the general circulation, saturine collyria will, in general, prove very serviceable. Under opposite circumstances, how-

* Allen's Synopsis Medicinæ, vol. i. s. 437.

† Burdach, Arzneimittellehre, vol. ii. 241.

ever, such applications will not only do no good, but almost invariably produce mischief. The use of this remedy has been no less common, as an injection, in gonorrhœa, than in ophthalmia; and it certainly is very often adequate to the removal of the disease.

The solution of sugar of lead, made into a cold poultice with the crumbs of bread, is also an excellent application in phymosis, hernia humoralis, and swelled inguinal glands. Applied in the same way, it frequently affords great relief in inflamed hæmorrhoidal tumours. This remedy has also been much praised by some writers for its effects in erysipelatous inflammation arising from external causes. By others, however, its use in this affection has been condemned; and my own experience has furnished me with no evidence of its usefulness in this respect.

M. Sommi, of Antwerp, has recently published some facts which go to show that the sugar of lead is a valuable remedy for arresting excessive salivation. An ounce of the acetate is to be dissolved in a pint of water, and used repeatedly during the day as a mouth-wash.

The sugar of lead may be given in doses of from half a grain to six grains, according to the nature and urgency of the symptoms for which it is administered. It is frequently given in the form of pills, in combination with opium. In administering this preparation of lead, care must be taken that the patient do not at the same time receive other substances into the stomach which have the power of decomposing it. The sulphates of magnesia and alum, for instance, would decompose the acetate and produce a sulphate of lead, which is entirely insoluble, and consequently inert.* Dr. Paris advises, that in taking the sugar of lead the

* Paris's Pharmacologia.

patient should abstain "from all potation except cold water or draughts composed of diluted acetic acid, for at least an hour after the ingestion of the medicine."

The immediate effects of an enormous dose of sugar of lead are, a sweet astringent taste, with a sense of constriction in the throat, pains in the stomach, with retching, or vomiting of bloody mucus, bowels constipated or relaxed, with bloody evacuations, fœtid eructations, hiccup, a sense of constriction in the thorax, with difficulty of respiration, great thirst, painful micturition, cramps of the extremities, cold sweats, convulsions, general sinking of the vital powers, and death. To counteract these effects, experience proves that much advantage may be derived from the early use of solutions of Glauber's salts, Epsom salts, and hard water. Orfila says that the liver of sulphur, which has been recommended by some, is pernicious. If the symptoms be not early subdued by these measures, and signs of gastric inflammation come on, the warm bath, fomentations, and leeches to the abdomen, with copious draughts of infusions of linseed or mallows, or of water sweetened with sugar, should be resorted to.*

Formulæ.

℞.—Plumbi acetatis gr. viii.
Aq. distillat. ℥vi.
Syrup. scillæ ℥ss.
Tinct. opii ℥ss.
—— digitalis ʒiss.—M. One ounce of this mixture may be taken three times daily in phthisis pulmonalis.

℞.—Vitel. ovi
Ol. amydalar. ʒii.
Mucilag. g. arab. ℥ss.
Plumbi acetat. gr. iii.
aq. fœnicul ℥v.—M. Take a table-spoonful every three hours.

* Orfila's System of Toxicology, vol. i. p. 484.

℞.—Plumbi acet. gr. vi.
Opii puriss. gr. iii.
Sacch. albi ʒi.—M. Divide into twelve equal parts. Take one three times daily.

℞. Plumbi acetat. gr. xv.
P. Digitalis purp. ʒss.
G. myrrh
Bals. peruvian
Extract. helenii āā ʒii.—M. Divide into two hundred pills. Take six or eight pills, three or four times daily.

SULPHAS ZINCI.

The emetic and tonic properties of this article have already been noticed; and to complete its remediate history, it remains, therefore, only to speak of its virtues as an astringent.

In chronic ophthalmia, a weak solution of the sulphate of zinc often produces excellent effects. It is certainly preferable, in such cases, to the acetate of lead, as having, besides its constringing, a greater roborant effect upon the dilated and debilitated capillaries of the inflamed part. As an astringent injection in gonorrhœa, its employment is very common. Its indiscriminate and unguarded use in this disease is, however, by no means to be approbated. It is much too harsh and irritating, and frequently gives rise to injurious consequences, when employed in the acute stage of the affection. When the discharge has assumed the character of gleet, it may generally be used with advantage. In injections for this complaint it is usually united with sugar of lead, to which some mucilage and a small portion of laudanum is commonly added.

The sulphate of zinc has been employed with much benefit against opacities of the cornea, and in pterygium or thickening of the conjunctiva. Himly used

it with success in tumours of the sclerotica and cornea, applied in the form of powder mixed with sugar. A solution of it forms an excellent gargle in apthous affections of the mouth, for which purpose it is highly recommended by Selle, Armstrong, Hertz, and others. A lotion composed of a pint of sage-tea, two ounces of honey, two drachms of the tincture of myrrh, and two scruples of sulphate of zinc, is often peculiarly beneficial in affections of this kind. The sulphate of zinc is a remedy of very considerable powers in chronic cutaneous eruptions. The famous ointment of Jasser consists principally of this article. I have frequently employed it in the form of a lotion in scabies with perfect success.

In obstinate venereal ulcerations, great benefit may often be derived from a lotion composed of two drachms of calcined sulphate of zinc, the same quantity of burned alum dissolved in two ounces of water, with the addition of a drachm of the tincture of galbanum.

This article affords one of the most effectual astringent injections in fluor albus. It may be very advantageously united with alum for this purpose. A drachm of each, dissolved in a pint of water, forms an injection of sufficient strength; but it is proper to observe, that neither this, nor any other application of this kind, can be employed with propriety before the vaginal inflammation has been moderated, by low diet, saline purgatives, and injections of warm water, or weak solutions of sugar of lead.

The sulphate of zinc has also been much praised as a remedy for the removal of polypus in the nose. Mursinna asserts, that we possess no application equal to the sulphate of zinc, to prevent the renewed growth of a polypus after it has been extirpated with the knife or forceps. He says, that it seems to possess a spe-

cific power in opposing the growth of such tumours, when any of its roots remain after an operation. He recommends the injection of a strong solution of this salt, for several weeks after an operation of this kind. It has also been employed with success as an escarotic, for removing fungus tumours seated in the external meatus of the ear.

Formulæ.

℞.—Sulphat. zinci ℥iss.
Mellis ℥i.
Tinct myrrh. ℥ii.
Spir. vini gallici ℥iss.
Infus. salviæ ℥viii.—M. An excellent gargle in ulcerated gums, tonsils, &c.

℞.—Pulv. sulph. zinci ʒii.
Flor. sulphur. ʒiii.
Axung. ℥ii.—M. In itch and other chronic cutaneous affections.

SULPHAS ALUMINÆ.

Alum is an earthy salt, consisting of sulphuric acid and alumina, with a portion of potass, or ammonia, or sometimes of both. "It crystallizes in regular octohedrons, whose sides are equilateral triangles." Its taste is sweetish, rough, and exceedingly astringent It dissolves in fifteen times its weight of water at 60°, and in three-fourths of its weight at 212°. It is also soluble in alcohol. When exposed to the air it slightly effloresces. "By the action of heat it first undergoes the watery fusion, then loses its water of crystallization, and lastly a great part of its acid," assuming a white, spongy appearance, friable and very light. It is decomposed by the alkalies and alkaline salt, carbonate and muriate of ammonia, carbonate of magnesia, tartrate of potass, lime-water, superacetate of lead, the mercurial salts, "as well as by many vegetable and

animal substances, especially galls and kino."* Hence, as Dr. Paris observes, the addition of alum to vegetable astringents is very injudicious.

Alum was well known to the ancients, but it does not appear to have been used by them as an internal remedy. Dioscorides and Hippocrates praised its effects as a lotion, in various kinds of ulcers, and particularly in sores of the mouth, and in spongy, swelled gums. Van Helmont, Helvetius, Mead, and Thompson, were among the first who brought its internal use into particular notice.

Lind speaks very highly of the powers of alum given with nutmeg in intermittent fever. He declares that, except the Peruvian bark, it proved more successful in his practice than any other remedy he ever used. Cullen speaks less favourably of it. During the present season, I have prescribed it in four cases combined with nutmeg and serpentaria. One of the patients was cured after using the remedy four or five days. According to Dr. Darwin, alum is particularly suited to the cure of fevers attended with disease of the bowels.

Alum is said to be one of the most effectual remedies we possess in colica pictonum. Grashuis was the first who used it in this disease. Richter speaks in the most exalted terms of its effects in this painful and often intractable complaint. The testimony of a great many others, eminent writers, might be adduced in favour of its virtues in this respect.† I have myself prescribed this article in several cases, with prompt and conspicuous advantage. In an instance which occurred to me, quite recently, relief was obtained from the alum, after

* Paris's Pharmacologia.

† Sommer, in Hufeland's Journal, d. Pract. Heilk. B. vii. st. 1, p. 73. Gebel, ibid. B. viii. st. 2, p. 195. Percival, Observ. and Experiments on the Poison of Lead, p. 71. Lentil Memoral. circa aerem, vitæ genus, sanitat, et morbis clausthaliens, p. 115.

opium, and the most active cathartics had failed to remove the affection. Fifteen grains of the powdered alum is to be given every two or three hours, either by itself or in combination with opium.*

In chronic discharges from the bowels, alum, either alone or in combination with other articles, has been frequently employed with considerable advantage. The alum whey forms an excellent remedy in such cases. I have known the use of powders composed of ten grains of alum, fifteen of calamus aromaticus, and one-fourth of a grain of opium, to arrest a chronic diarrhœa, of long standing, very promptly, without any disagreeable consequences. Alum has also been successfully employed in internal hæmorrhage. Van Helmont gave it with much success in uterine hæmorrhages; and Cullen states that he found it serviceable in bleedings from the uterus, but not in those from the lungs. This, he thinks, was owing to the latter variety of hæmorrhage being almost invariably of the active kind. In protracted sanguineous discharges from the uterus, connected with great relaxation of the solids, alum is undoubtedly a very valuable remedy. In cases of this kind it is very advantageously administered in combination with Peruvian bark. Where the pulse is active it ought not to be given without previous depletion. Leake used a solution of this substance in the form of an injection in this variety of hæmorrhage. Alum has also been much extolled for its remediate powers in leucorrhœa; and, employed as an injection in this disease, it is certainly capable of doing considerable good. I have prescribed it occasionally in this way, though seldom with decided advantage. Where this disease is attended with great relaxation of the general system, or with that habit of body which has been denominated

* Richter's Specielle Therapie, B. iv. p. 201.

leucophlegmatic, alum, combined with the rust of iron, is said to be peculiarly beneficial, as an internal remedy. I have also used the alum in union with ipecacuanha, with much advantage in this complaint. From six to ten grains of the former, to four or five grains of the latter, may be given twice or three times daily. Dr. Dewees states that he has used the alum in combination with nitre in leucorrhœa, with complete success in several very obstinate cases.

Diabetes is another disease in which alum has been successfully used. Its employment in this complaint was particularly recommended by the celebrated Dr. Mead, and by Dover. Selle, also, states that he cured an obstinate case by giving the patient thirty grains of alum three times daily.* The majority, however, of those who have tried the alum in this disease, do not speak favourably of its powers; and it does not, at present, enjoy any particular reputation in this respect. Used as an auxiliary to other measures, the alum whey may, no doubt, often be serviceable. As a principal remedy, however, it is certainly not to be relied on. The alum has also been recommended in flatulent colic, gastric debility, and in colliquative sweats, &c.

I have known very decided benefit to result from the internal use of a mixture of alum and the nitrate of potass in erysipelas and other forms of local inflammation tending to gangrene. Three grains of the former with ten of the latter article, should be given every two hours.

Alum has likewise been recommended as a useful remedy in morbid dilatation of the cavities of the head. Professor Dzonde speaks particularly in favour of its powers in cardiac affections of this kind. (Aeskulap. Bd. i. 1821.) He states that he has derived unques-

* Beitraege zur Natur. and Arznei. &c. B. i.

tionable benefit in habitual palpitations of the heart, from morbid dilatation, from a solution of two drachms of alum in six ounces of water, given in doses of a table-spoonful, five or six times daily. Sundelin (Arzneimittell. B. ii. p. 244,) also asserts, that he has used this article with great advantage in a case of this kind. As an external application, alum may be advantageously employed in a variety of complaints. In relaxations of the uvula and cynanche tonsillaris much benefit may often be derived from the use of gargles containing alum. "In many persons," says Dr. Cullen, "who are liable to be affected with swellings of the tonsils, we have known the disease prevented, or soon removed by a decoction of oak bark, to a pound of which a half a drachm of alum and two ounces of brandy were added."*

Bretonneau has recently published a statement which goes to show that alum may be very beneficially used as a local remedy in croup, more especially in that variety of the disease, which commences by inflammation in the fauces, and the formation of pseudo membraneous structure on the tonsils, &c. His mode of using it is to blow some finely powdered alum, through a small tube, into the fauces. When thus applied it is said that this substance often speedily arrests the further progress of the malady.

To arrest the bleeding of leech bites, on parts where compression cannot well be made, a solution of alum or powdered alum applied to the part, will in general answer better than any other application.

In ophthalmia, after the inflammation has been somewhat subdued by local and general depletory measures, or in the chronic form of the complaint, the alum

* Mat. Med. vol. ii. p. 12.

curd,* as it is called, will, in general, prove very serviceable. Cullen states, that he has found the solution of alum, in the proportion of five grains to the ounce of water, still more effectual than the coagulum aluminosum. In the beginning of acute ophthalmia, these applications will very generally prove hurtful. Alum has also been used as an injection in gonorrhœa. In gleet it may be useful, but in recent gonorrhœa it is much too harsh and irritating, and ought never to be employed.

CALX.

As a mild astringent, lime-water is a remedy of very considerable utility. In the advanced periods of dysentery, diarrhœa, and in cholera infantum, it often produces excellent effects. In the chronic form of the latter disease I have been in the habit of prescribing it in union with a weak infusion of cinchona, and it has very generally appeared to me to be of service. Where there is acidity in the primæ viæ, attended with vomiting or diarrhœa, the lime-water is doubly indicated. In such cases it at once corrects the vitiated contents, and allays the morbid irritability of the stomach and bowels. It is, indeed, one of our most useful remedies to check inordinate vomiting. For this purpose it is usually administered with milk, given in doses of a tablespoonful of each every twenty or thirty minutes. Under the head of Antacids I have already noticed its utility in dyspeptic cases attended with acidity of the primæ viæ.

Hoffman asserts that lime-water is the most effectual

* This is made by rubbing a piece of alum with the white of eggs in a plate until a coagulum is formed. It is applied to the eye between two pieces of fine linen.

remedy we possess in scurvy arising from the continued use of salted provisions. This, however, is not confirmed by the experience of others.*

As an external remedy, lime-water may often be advantageously used in old fungous ulcers, attended with inordinate discharges of a serous matter. It has also been recommended as affording great relief from the pain and fœtor of malignant ulcers. It is even asserted to have been used with success in genuine cancer. Baumbach, a German writer, relates two cases of cancerous ulcerations of the lips and breast, which, he says, were effectually cured by the internal and external use of lime-water.† In the cure of porrigo larvalis, or crusta lactea, lime-water, used both externally and internally, is recommended by Barlow, Dreiszig, and Wichmann,‡ as an efficacious remedy. Hufeland recommends a liniment made of equal parts of lime-water and sweet oil, as one of the most effectual applications in herpes.§ This liniment, with the addition of a portion of laudanum, is also a very excellent application in burns and scalds. I have repeatedly seen its virtues in this respect exemplified.

Chloride of Lime.—This is one of the most powerful disinfecting agents we possess; and in consequence of its valuable properties, in this respect, has of late years become a highly important substance, "in its application to medical police." It possesses the property of arresting or preventing putrefactive decomposition, and of destroying or neutralizing the foul and pestilential effluvia, which proceed from decaying and putrefying animal and vegetable matter. "It is employed for dis-

* Burdach, Arzneimittellehre, B. iii. p. 500.

† Vogel, resp. Baumbach. Diss. de curatione cancri occulti et aperti per aquam calcis vivæ potam præstita.

‡ Ideen Von Diagnostick, B. i. p. 50.

§ Journal der Practischen Heilkunde, B. xxiii. st. 3, p. 209.

infecting dissecting rooms, privies, common sewers, docks, and other places which exhale offensive effluvia. In destroying contagion and infection, it is also highly useful. Hence hospitals, alms-houses, jails, ships, &c., may be purified by its means. In short, all places, which may be deemed infectious, from having been the receptacle of cases of virulent disease, may be more or less completely disinfected by its use, after they have undergone the ordinary processes of cleansing."

The chloride of lime has also been strongly recommended as an application to ill-conditioned ulcers, burns, cutaneous eruptions, and certain forms of ophthalmia. When applied to foul and offensive ulcers, it not only completely destroys their fetor, but in general, greatly improves their appearance and condition. From one to four ounces of the chloride, dissolved in a pint of water, "forms a solution within the limits of strength ordinarily required for this purpose." The best mode of using it is, to saturate lint with the solution, and applying it to the ulcer. In *purulent ophthalmia*, much benefit may sometimes be obtained from a solution of this salt, employed as a collyrium. Mr. Varlez, surgeon of the Military Hospital at Brussels, and Mr. Gutherie, regard this solution as the best astringent application we possess in the variety of ophthalmia. Mr. Varlez declares that he has employed this collyrium in more than four hundred cases of this complaint, and invariably with marked benefit. After the local and general inflammatory excitement has been moderated by depletory measures, a solution of this salt, in the proportion of a scruple to an ounce of water, should be applied to the inflamed conjunctiva. If the inflammation does not subside, and the patient bears the application of the solution without complaining, its strength may be increased, to one, two, or

even three drachms of the salt in the same quantity (an ounce) of water. In the purulent ophthalmia of infants, I have, in several cases, used this remedy, in the proportion of ten grains of the chloride to an ounce of water, with great advantage. A small portion of it should be carefully injected under the eye-lids, two or three times daily. In that singular gangrenous pustule of the lips, peculiar to children, called *noma*, or *aquatic cancer*, the local application of the chloride of lime has been found signally beneficial. A case of this affection is related in a late number of Hufeland's Journal, by Mr. Berndt, which, "in the course of eight days, was entirely cured by this application." A paste was made with the chloride and a small portion of water, and applied to the lip of the child every two hours during the day. In proportion as the disease yielded, the remedy was less frequently used.

Dr. Gubian, of Lyons, asserts, that if the pustules of small-pox, about the ninth or tenth day, when in full suppuration, be punctured, and afterwards washed several times daily, with a weak solution of the chloride of lime, the drying will be very rapid, and the pocks leave no marks or cicatrices. (Jour. de Chimie Medicale, Mai, 1830.)

Dr. Graefe, of Berlin, has recently employed this remedy, internally, with entire success in *gonorrhœa*. He administered it in the form of an emulsion composed of a drachm of chloride of lime, seven ounces of almond emulsion, and an ounce of syrup. "The dose of this mixture is a table-spoonful, containing about four grains of the chloride, to be repeated every three hours. Three or four portions are usually sufficient to effect a cure. The medicine, at first, usually excites an increased flow of urine, with irritation of the urethra; but these

symptoms soon disappear, and the discharge diminishes with them." (Rev. Medicale, July, 1830.)

Liquor calcis muriatis, or muriate of lime. (Pharm. U. States.) This preparation of lime was formerly much extolled for its efficacy in scrofulous affections. Fourcroy, Beddoes, and Hufeland have published very favourable accounts of its effects in this disease. It was particularly recommended as an internal remedy in ulcerations, and ophthalmia of a scrofulous character. I have employed it in affections of this kind, but never obtained any obvious advantage from its use.

BARYTES.

The only preparation of barytes employed in medicine is the muriate. This salt has a bitter and pungent saline taste. Given in a moderate dose, it does not manifest any sensible operation. An inordinate dose, however, excites nausea, vomiting, and sometimes anxiety, palpitation, and vertigo. Hufeland states, that he has known this medicine to produce a continued feeling of distressful anxiety for several days without any other obvious effect. It often occasions, when first used, and especially in patients who have worms, slight griping pains, with diarrhœa. It generally keeps the bowels somewhat relaxed. It has no perceptible effect upon the pulse. Hufeland says, that it appeared to him rather to retard than accelerate it. The excretory organs are more obviously influenced by this remedy. It generally augments the urine and cutaneous exhalation. Applied to the skin, it produces a smarting, burning pain, and when concentrated it proves escharotic.*

* Hufeland, Darstellung der Medicinishen Kräfte der Salzsauren Schwererde, p. 15.

The muriate of barytes, or, as it was formerly called, terra ponderosa, was first introduced to the notice of the profession by Dr. Crawford,* of England, as a remedy of great powers in scrofulous affections. This writer assures us that he has found it successful in many of the most confirmed cases of scrofula. Mr. Pearson and Drs. Clark and Hamilton, have published observations confirming Dr. Crawford's statements upon this subject. In Germany and France this remedy has found a number of able advocates. Goering, Fourcroy, J. A. Schmidt, Petermann, and especially Hufeland, have published statements illustrative of its beneficial effects in affections of this kind. It cannot, indeed, be doubted that it has been found useful in this disease; but later experiments with it, in this country as well as in Europe, do not justify the high praises that have been bestowed on it. Ferriar, Kretschmar, Fleisch, Henke, Richter, &c. employed it in large and continued doses, without deriving the least advantage from it.† Some writers, among whom are Girtanner and Arnemann, have represented it as frequently productive of highly injurious and even poisonous effects.

In a single instance of violent and obstinate scrofulous ophthalmia in a child, I prescribed the solution of this substance, and had the satisfaction to see my patient get well under its use. In employing this medicine, it is necessary to continue its use for a long time. In very tedious cases, Hufeland observes, its use should be interrupted every eight or fourteen days, and a purgative interposed. This remedy is said to be most useful when there is an inflammatory and very irritated condition of the lymphatic system present, or where the bowels are loaded with irritating

* Duncan's Medical Commentaries, vol. iv. Dec. 2, p. 433.

† Richter's Specielle Therapie, vol. v. p. 623.

and bilious matters. It is especially efficacious when the disease appears in the form of cutaneous eruptions. In cases attended with great relaxation and weakness, or where symptoms of hectic are present, it seldom does any good, and often harm. Nor can it be used with benefit in cases complicated with scorbutic affections.*

The muriate of barytes has also been used with advantage in herpetic eruptions, scabies, porrigo, scirrhus, amenorrhœa, and mania; successful examples of all of which are mentioned by Hufeland and others.

The dose of this remedy is from ten to fifty drops every three hours, of a solution of one drachm in an ounce of distilled water. It should always be commenced with in a small dose, and gradually augmented.

The sulphuric and nitric acids, the alkalies, magnesia, tartarized antimony, burned sponge, and flowers of sulphur decompose it. Antimonial wine renders it slightly turbid, but does not entirely decompose it. It may be given with vegetable extracts and syrups, and decoctions, alcohol, corrosive sublimate, arsenic, without having its compositions affected.

ACIDUM NITRICUM.

The nitric acid has, within the last twenty or thirty years, become an article of very considerable importance in therapeutics. M. Alyon, a French physician, introduced it to the notice of the profession as an exceedingly valuable remedy in syphilis. He published a number of cases illustrative of its efficacy in this disease; and it was soon afterwards tried by several eminent English physicians, whose reports on its effects were very favourable. Cruickshank, Scott, Sandford,

* Hufeland, op. citat.

and Hammick, published observations tending to confirm its character as an efficacious antisyphilitic remedy. But no one was more extravagant in its praise than Beddoes.* As is usual, however, with new remedies, it did not long sustain the reputation it at first acquired. The result of the experience of the profession on this subject is,—that in old cases of syphilis, connected with a cachectic condition of the system, the nitric acid is capable of mitigating the disease, but is inadequate to a perfect cure. In cases of this kind, and especially when symptoms of scurvy are complicated with it, much benefit may commonly be derived from the alternate employment of the acid, and mercurial remedies. Where mercury fails to remove the symptoms entirely, and rheumatic pains, nodes, ulcers, &c. remain, the acid will sometimes prove highly serviceable. It is seldom sufficient to prevent the occurrence of secondary symptoms; though it will often remove them after they have made their appearance.

The nitric acid has been recommended as a very useful medicine in chronic hepatitis, as well as in scrofulous ulcerations. I have used it in some cases of the former disease with advantage; but I have not known it to perform a perfect cure. This acid has also been recommended in dysentery and diarrhœa, but its use in this way does not appear to merit much consideration.

This acid may also be beneficially used as an external application to syphilitic ulcers,† and in certain chronic cutaneous eruptions.‡ Plenk recommends an ointment made of nitric acid and ung. althæa, of each half an

* On the Effects of Nitrous Acid, &c. 1797.

† This is said to be an excellent ointment for purposes of this kind: ℞. Acid nitric. concentr. ʒi. pingued. vacc. ℥i. misce int. sub leni igne et adde, opii puriss. ʒi. fiat unguentum.

‡ Alyon, Essai sur les Proprietés Medicinales d'Oxygene, 1791.

ounce, and two drachms of ung. juniperi, applied twice a day, as highly efficacious in tinea capitis. The nitric acid may be taken from one to two drachms daily, diluted in a quart of water, to which six or seven ounces of syrup is added. Its use increases the appetite, accelerates the pulse, augments the secretion of urine and saliva, and when long continued, produces a tenderness of the gums.*

The nitro-muriatic acid has lately attracted very considerable attention, both as an external and an internal remedy. Dr. N. Scott was the first who noticed the superior remediate powers of this mixed acid.† It appears to have a very particular tendency to act upon the glandular system, and especially to excite the secretory action of the liver and cutaneous exhalents. "As a very general rule for its employment," says Dr. Scott, "it may be observed, that whenever the mercurial preparations are indicated, the nitro-muriatic acid will be found useful, with this difference, that in cases where mercury is highly injurious from delicacy or peculiarity of constitution, or from other causes, the nitro-muriatic acid may be employed with safety and advantage." It is inadmissible in acute diseases. It is especially recommended in chronic hepatitis and in functional disorders of the liver. In these diseases Dr. Scott considers it as the most effectual and the safest remedy. It is said, likewise, to be very efficacious in syphilitic and pseudo-syphilitic affections. Dr. James Johnson, who appears to place considerable reliance on the nitro-muriatic bath, in the treatment of chronic hepatitis, gives the following directions for preparing and using it: "Into a glass vessel capable of holding a pint or more of fluid, put eight ounces of water, and then

* Richter's Specielle Therapie, vol. v. p. 321.

† Beddoes' Contributions.

pour in four ounces of the nitric acid of the London Pharmacopœia, and four ounces of muriatic acid. One ounce of this mixture to a gallon of warm water, will form a bath of medium strength, and such as Mr. Astley Cooper commonly prescribes. The proportion may be increased to one ounce and a half, or diminished to half an ounce of the solution to the gallon of water, according to the age, strength, delicacy, or other peculiarity of the patient. The feet and legs of the patient ought to be immersed in this bath at a comfortable warm temperature, say 96°, and kept there twenty minutes or half an hour, just before going to bed. This may be done every night, or every second night, and the same bath will remain good for five or six nights."*

It is proper to observe, however, that several very respectable physicians, who have published the result of their experience with the nitro-muriatic acid bath, have not found it to answer the expectations which were excited by the publications of Dr. Scott and others. Mr. Guthrie, deputy inspector of military hospitals, states, as the result of his experience with this remedy, that it is of very uncertain operation, and that no dependence can be placed on it. He does not, however, contend that the remedy is entirely destitute of useful powers. "It seems often," he says, "not to produce any effects whatever, however extensive its application; and yet the complaint for which it has been used shall slowly subside or disappear, whilst in other instances it remains stationary or gets worse."† From my own experience I know very little of this remedy. I have employed it in a few instances of functional derangement of the liver; but as it was alternated with

* On the Influence of Tropical Climates.

† Medico-Chirurgical Transactions, vol. viii. for 1817.

mercurial remedies, I am not able to say how much of the beneficial result is to be ascribed to its operation. It appears to be beyond a doubt, however, that it is possessed of very useful remediate powers. But no one will now pretend to say that it approaches mercury in any of the diseases in which it has been recommended. It may, nevertheless, be sometimes usefully substituted for mercury, where this article cannot be given on account of idiosyncrasy, debility, or other causes. It may even occasionally happen to prove effectual where mercury has done no good, or has been hurtful. This has been observed of a variety of articles whose remediate powers are in no respect equal to this metal.

ACIDUM SULPHURICUM.

The sulphuric acid is a medicinal agent of very considerable importance. By the German physicians this acid is very frequently prescribed in hæmorrhagies; and some of the older English writers recommend it very highly for its powers in such cases. Sydenham especially considered it as a remedy of great use in hæmorrhagy; at present it is only prescribed as an auxiliary, after the immediate violence of discharge has been restrained by more active measures. In spitting of blood, and in slight but protracted bleedings from the uterus, it often answers very good purposes. As a tonic this acid is very frequently administered. It seems to be particularly adapted to invigorate the digestive organs during convalescence from febrile diseases. Sometimes, however, it will produce unpleasant affections of the stomach, such as pains and nausea. When this occurs, it must, of course, be at once discontinued.

The sulphuric acid is a very efficacious remedy in certain chronic eruptive diseases. The use of it in this way originated, I believe, in Germany. Dr. Cothenius, principal physician of the Prussian army, employed it for the cure of the itch, in 1756. It has, since that time, been employed and commended by many of the most eminent physicians of Europe. Crollius, Tissot, Baldinger, Hafenreffer, Gahn, Richter, and a number of other writers have mentioned its virtues in this respect. Richter observes, that the external application of this acid, diluted with water, is perhaps the most useful of all our remedies in itch complicated with a scorbutic habit of body.* Dr. Kinglake, also, has found this acid very effectual in cases of this kind.† Dr. Fosbroke, of Berkeley, in England, has recently published a paper on the use of diluted sulphuric acid in cutaneous affections, in which he relates several very striking examples of its efficacy. He prescribed it in an obstinate case of lichen agrius, with prompt success. It was taken in a decoction of elm bark and of the wood of solanum dulcamara, "using, at the same time, as a wash, a decoction of the deadly nightshade.‡ It should be taken in as large doses as the stomach will bear; from one to four drachms, properly diluted, may be taken in twenty-four hours. It is usually employed in the form of the acidum sulphuricum aromaticum, or elixir of vitriol. Made into an ointment with lard, it forms a very efficacious application in diseases of this kind. In this way I have repeatedly employed it with prompt success in the itch. I have also cured a distressing case of prurigo

* Specielle Therapie, tom. vi. p. 179.

† London Med. and Phys. Jour. 1801, p. 614.

‡ London Medical and Physical Journal, for July, 1822, vol. xlvii. p. 483.

formicans, by the external and internal use of this remedy alone. The ointment is made by simply incorporating the acid with lard, in the proportion of about thirty drops to an ounce of the latter.

Quite recently I have been informed by Dr. J. R. Lucas, of Brunswick, Virginia, that the sulphuric acid, properly diluted, forms an exceedingly efficacious injection in gonorrhœa.* I have tried it in one instance with success. About eight drops of the acid should be mixed with eight ounces of water, when used for this purpose.

* American Medical Recorder, for October, 1822.

CHAPTER VIII.

MEDICINES WHOSE ACTION IS PRINCIPALLY DIRECTED TO THE UTERINE SYSTEM.

I. *Medicines that Promote the Menstrual Discharge.*

EMMENAGOGUES.

Under this class are arranged such remedies as are supposed to be capable of promoting the menstrual discharge. It is very doubtful, however, whether any of the articles which have hitherto been employed for this purpose, possess any direct influence over the uterine secretions. We know, at least, that their emmenagogue effects are very uncertain; and that remedies of the most opposite character do occasionally, under peculiar circumstances, produce such effects.

That the menstrual discharge is a secretion, and not a mere effusion of blood from the extremities of the uterine vessels, is an opinion now pretty generally entertained. This opinion is distinctly expressed by Allen, in a quotation from an author whom he does not mention. "I dare assert," says he, "that the menses proceed entirely from the superfluous chyle concocted into a viscid humour, which by degrees mixes with the mass of blood, and, as is well known of all the several other secretions, is separated *by the glands situated there for that very purpose*, as manifestly appears on the dis-

section of those parts. The menses are considerably more viscid and thick than the rest of the blood, and have generally an ungrateful and unusual smell, very different from what is drawn off by bleeding, or flows from an hæmorrhage."* Bordeu, too, in his invaluable Treatise on the Glands† advances the same opinion.

Whatever opinion we may adopt in relation to the nature of this evacuation, certain it is, that whenever it becomes irregular or suppressed, the health always suffers more or less disturbance. Even the peculiar destiny of the sex,—the noble prerogative of becoming mothers, is destroyed, and with it, often, the tenderest hope of the female.

I have already said that it does not appear probable that any of our emmenagogues exert any direct action upon the uterus. If this were the case, we might, I think, calculate with much more certainty, on the operation of these remedies, than experience teaches us to do. If we attend particularly to the effects of these articles, we discover that many of them have a decided tendency to increase the flow of blood to the pelvic viscera generally. This is also the case with some other means occasionally resorted to for the restoration of obstructed catamenia, and which cannot be properly placed under the head of emmenagogues. Thus ligatures on the thighs, the semicupium, and fomentations to the external parts of generation, can only act by creating a local plethora in the vessels of the pelvic viscera, and consequently of the uterus. I have known the extirpation of large hæmorrhoidal tumours to restore suppressed catamenia, by which the local drain of blood from these parts was removed, and the ordinary fullness of the uterine vessels re-establish-

* Synopsis Medicinæ, vol. ii. p. 232.

† Traite des Glandes.

ed. It is not necessary that we should regard the menstrual discharge as a mere effusion of blood, arising from local uterine plethora, in order to admit this explanation of the modus operandi of emmenagogues. The phenomena are perfectly compatible with our notions of the secreted nature of the menstrual discharge. There is an intimate relation between the degree of exaltation in the vital properties of a part, and the quantity of blood circulating through it. We find, accordingly, that whatever increases the flow of blood to a gland, increases also its secretion. It is in this way, perhaps, that all irritations increase the peculiar secretions of the organs to which they are applied. They produce an immediate flow of blood to the organs irritated, the vital properties of which are thereby elevated, and a larger secretion of their peculiar fluid takes place.

We can, therefore, readily understand how an increased determination of blood to the pelvic viscera may very often remove torpor in the uterine vessels, and thus restore the suppressed catamenia. Although emmenagogues are a class of remedies expressly set apart as means for removing catamenial obstruction, they yet, in reality, constitute but a small portion of our remediate resources in such cases. In a very great number of instances we find it necessary to have recourse to general remedies, to the exclusion of such articles as are technically denominated emmenagogues. If, for example, the catamenia cease to flow in consequence of a general relaxation or debility of the system, our best curative means, of course, are such as invigorate the vital powers. Hence, tonics, exercise, the cold bath, an invigorating diet, &c. do occasionally produce the best effects in cases of obstructed menstruation. A suppression of the menses is also fre-

quently attended by a state of the system directly the reverse of that of debility and relaxation. There is a rigidity of fibre unfavourable to the regular performance of some of the organic functions; the habit is full and inflammatory, and though apparently vigorous, easily subdued by any unusual exertion. In cases of this kind, all the stimulating emmenagogues would, without the use of previous depletory measures, not only be ineffectual, but injurious. Bleeding, a temperate diet, tepid bath, &c. are here the proper remedies; and they often restore the regular evacuation of the catamenia, in a prompt and effectual manner.

In prescribing, therefore, for suppression of the menses, it is of the utmost consequence that we attend to the general state of the system. Without such attention, indeed, our success must not only be extremely precarious, but our remedies very often increase the mischief we are called upon to remedy.

Alibert justly observes, that there are few disorders which depend on such a variety of causes, or are connected with such different conditions of the general system, as obstructed catamenia. Hence, its remedies are so various, and often of such contrary character; and hence, too, the great uncertainty of all our remediate measures in such cases.

RADIX HELLEBORI NIGRI.

The plant which furnishes this article is indigenous to the Austrian Alps, the Appenines, and the Pyrenees. The root, which is the only part employed in medicine, consists of numerous black fibres, springing from knotty branches, which issue out of a central radical tuber. Its taste is acrid, bitter, and nauseous, and,

when chewed, it imparts a benumbed feeling to the tongue.*

Water and alcohol draw from it a bitter and acrid extract. According to the analysis of Vauquelin, its constituent principles are, a very acrid essential oil, a small portion of extractive matter, fæcula, a vegeto-animal substance, and salts.

Geise considered the acrid oleo-æthereal fluid as a peculiar principle, to which he gave the name of *helleborinum*. According to Pfaff, however, this substance approaches more to the character of a resin than to an essential oil. It is best extracted by alcohol, and is distinguished by its leaving an exceedingly acrid taste in the back part of the mouth and fauces when chewed.†

The root loses its active properties by age. Its fibrous are much more powerful than its knotty or tuberous parts.

This is one of the most ancient articles of the materia medica. Ctesias, who lived in the time of Plato, and anterior to Hippocrates, speaks of it as a medicine of important virtues. It was particularly celebrated with

* The root of black hellebore is not unfrequently adulterated by other roots, some of which are powerfully poisonous. The roots of the adonis vernalis, trollius europæus, actæ spicata, astrantia major, helleborus fœtidus, veratrum album, and aconitum neomontanum, are occasionally mixed with or entirely substituted for it. The root of the adonis vernalis may be distinguished from that of the black hellebore by the fibres not issuing from branches, but immediately springing from a central tuber; they are also more numerous and more fleshy, externally darker and internally whiter, than those of the hellebore. The principal root of helleborus fœtidus is thin, not knotty, nearly straight, with fewer fibres, which are short, very black, and much more acrid than those of helleborus niger. The root of actæa spicata is spindle-shaped, jointed, yellow within, with woody fibres. Trollius europæus has a very short radical tuber with branched fibres, which have neither taste nor smell when dry. The root of astrantia major is articulated, spindle-formed, and slightly acrid. That of aconitum napellus is roundish, spindle-shaped.

† Pfaff's Mat. Med. tom. iii. p. 253.

the Greek and Roman physicians as a remedy in mania. The extraordinary cures performed at the island of Anticyrus, famous for its hellebore, are celebrated by the poets and historians of antiquity. The doses which the ancients employed were, however, much larger than we would venture upon at the present day, and its effects accordingly were often excessively violent. It appears, indeed, by the accounts which have reached us of the employment of this article among the ancients, that they never expected to cure, without producing with it symptoms of a very violent character. Hence Oribasius, in his treatise on the use of hellebore, has two chapters, entitled, "Quæ faciendum sit quum strangulatio occupat eos qui Elleborum sumpserunt," and "Quæ fasiendum sit ubi vox et sensus ammittitur."*

When given to animals in large doses, hellebore produces the following effects:—slow and difficult respiration; slowness and sometimes irregularity of pulse; vomiting of mucous and bilious matter; an increased flow of saliva; trembling and unsteadiness; vertigo; convulsions followed by tetanus, and diminution of heat. The animal finally becomes cold, respires after long intervals, and dies.† From a variety of experiments performed by M. Orfila on dogs, he concludes—1. That powdered hellebore applied to the cellular texture, is rapidly absorbed into the circulation; 2. That its local effects are confined to the production of slight inflammation; 3. That "the part which is soluble in water is that in which the poisonous property of the hellebore resides;" 4. That the alkaline extract of black

* Medical Sketches by G. Kerr, p. 22.

† A Memoir upon the Effects of Helleborus Niger and Albus, by M. Schabel, of Weissenburg, read in Sept. 1818, to the Society of Emulation, of Paris.

hellebore, which forms part of Bacher's tonic pills, is also extremely active.*

When taken into the human stomach it manifestly increases the force and rapidity of the circulation, and excites a sensation of warmth throughout the whole body. When taken in large and repeated doses, its effects are often, as I have already stated, very violent. Independent of the powerful vomiting and purging which this article is known sometimes to produce, its long use occasions a singular feeling of coldness in the abdomen, muscular debility, anxiety about the heart, slow and small pulse, headache, stiffness of the muscles of the neck, pain in the glands about the throat, slimy whitish mucous discharges from the bowels, spasms, delirium, hæmorrhages, &c.†

The emmenagogue virtues of this article remained unnoticed until the celebrated Mead announced them to the public. As is usual with those who introduce new remedies, he lavished the most extravagant encomiums on the emmenagogue powers of this substance. On the continent of Europe, especially with the Germans, this remedy stands in no small repute. But in England, as well as in this country, the authority of Cullen, who regarded it as nearly inert in this way, has thrown it into unmerited neglect.

It seems to me quite certain, however, that both Mead and Cullen were wrong in their estimates of the powers of this medicine, and that it is entitled neither to the extravagant praises of the one, nor the unqualified condemnation of the other. Indeed, within a few

* System of Toxicology, by M. P. Orfila, M. D., translated by J. G. Nancrede, p. 208.

† Buchner de salutarii et noxio Ellebori Nigri usu. Halæ, 1748. Burdach's System der Arzneimittellehre, vol. iii. p. 124. Hartman de virtute Hellebori Nigri.

years past, its reputation as an article of the materia medica seems to be again advancing.

Hellebore appears to possess a very considerable tendency to determine the circulation to the hypogastric and pelvic viscera. This is evinced by the sense of weight and pain which patients generally experience after having taken it for some days; I have known this determination to be so great as to produce a profuse hæmorrhagy from the uterus.

From its stimulant properties, one would be led to regard it as inapplicable to cases where there is a fulness of habit, or in a sanguine constitution. Yet Mead, Lewis, and other eminent writers say, that it is precisely in such cases that its emmenagogue virtues are most conspicuous. Burdach, however, in his excellent work on the materia medica, asserts that it is particularly valuable in cases of torpor, where the face is pale and leuco-phlegmatic, and the pulse soft. To this latter opinion I am inclined myself; at least, my own experience goes directly in favour of it, independently of the theoretical considerations which point that way.

In a recent work on the materia medica,* it is stated that it is especially useful as an emmenagogue when it purges, in cases attended with torpor and constipation of the bowels, and "perhaps with a degree of insensibility of the uterus." My own experience, however, leads me to a contrary conclusion. It does not appear to me that its cathartic effects are, under any circumstances, necessary, or even accessory to the attainment of its emmenagogue results. I have been much in the habit of employing this article in amenorrhœa, and it has always appeared to me, that, whenever it purged freely, as it generally does when it purges at all, it was

* Elements of Therapeutics, &c. by Dr. N. Chapman.

less apt to evince the desired effects. If, indeed, its emmenagogue powers depend upon its tendency to produce a local plethora in the uterine system, we can easily imagine how an active catharsis should lessen these effects.

It may be exhibited in substance, or in the form of extract, infusion, or tincture. The extract is given in the dose of from six to ten grains. The tincture is most commonly employed; its dose is from twenty to forty drops, two or three times a day, in a cup of some aromatic tea, such as rosemary, pennyroyal, &c. Bacher's pills answer extremely well. They are composed of equal parts of the extract of hellebore, myrrh, with a small portion of carduus benedictus.

Given as an hydragogue, these pills have been taken to the extent of thirty a day, in three doses of ten each, at the distance of an hour between every dose. Taken in this way they produce very copious evacuations by stool and urine. "During their use the patients must be enjoined to drink plentifully of mild liquids. Upon a due attention to this circumstance, viz. dilution, the success of the remedy as an hydrogogue in a great measure depends."

Formulæ.

BACHER'S PILLS.

℞.—Extract. hellebori nigr.
Ext. myrrh. aq. āā ʒi.
Pulv. card. bened. ʒiii.—M. ft. Divide into one grain pills.

℞.—Tinct. hellebor. nigr. ʒi.
—— aloes soccot. ʒss.
—— opii ʒi.—M. Dose, a tea-spoonful three times daily.

℞.—Tinct. hellebor. nigr.
—— secale cornut. āā ʒss.—M. Dose, a tea-spoonful three times daily.

℞.—Extract. hellebor. nigr.
——— sabinæ āā ʒi.
——— aloes soccot. ʒss.—M. Divide into three grain pills. Take one twice daily.

JUNIPERUS SABINA.

Savin is a small evergreen tree, of the cedar species, indigenous to Italy, Portugal, and Switzerland, where it grows in elevated situations in considerable abundance. It is cultivated, with us, in gardens, and is perhaps, of all other articles of this class, the most commonly known for its emmenagogue virtues.

Its leaves contain a large portion of a very pungent essential oil, to which the medicinal virtues of the plant may be fairly ascribed.

When taken internally, it powerfully excites the vascular system. It produces a manifest flow of blood to the uterine system; and, when taken in large doses, occasions great heat, agitation, hæmorrhage, and inflammation of the bowels.

The testimony of Dr. Home, of Edinburgh, is strong in favour of the emmenagogue powers of this plant; and until the time of Cullen, it was very generally regarded as one of the most potent articles of this class of remedies. By this writer, however, whose authority, though great on all subjects, has, perhaps, often been too implicitly received, the reputed emmenagogue virtues of this substance were considered as unimportant. It therefore soon fell into general disrepute both in England and in this country.

When amenorrhœa depends on a relaxed state of the general system, or on an inactive and torpid condition of the uterine system, the savin may be often very advantageously employed.* It need hardly be observed, that its great stimulant properties render it inapplica-

* Bayler über die heilkraft. der sabina. Burdach's Arzneimittellehre, vol. iii. p. 300.

ble in cases attended with a high degree of phlogistic diathesis.

Wedekind,* a German writer of great respectability, says, that this article may be applied with very great advantage in the treatment of that atonic, or relaxed state of the uterus, attended with an unnatural secretion and soft swelling of this organ, which is sometimes met with in women of advanced age, who have suffered much from repeated child-bearing or abortions, and which is generally attended with a train of hysteric disturbances.

I have occasionally employed this article in cases of amenorrhœa, in females of a relaxed habit of body; and, though sometimes without success, I have had sufficient evidence of its powers in this way to establish, in my opinion, its just claims to our attention.

Savin has been employed in various other affections, in some of which its remediate powers seem to be very considerable. Rave, a German writer of respectability, speaks in the highest terms of its use in chronic rheumatism.† I have employed this remedy for more than ten years past, in this disease, and I can truly say that its good effects have, in my practice, often been surprisingly prompt and decisive.

Savin, according to some writers, possesses active anthelmintic powers.‡ From my own experience I can say nothing of its virtues in this respect.

Werlhof speaks well of this article in caries of the bones. It has also been much extolled by some German writers for its remediate powers when applied to old and obstinate ulcers, either in the form of decoction or

* Wedekind über die anwendung der sabinæ by frauenzimerkrankheiten. In Hufeland's Journal, vi. Bd. 1st. nr. 3.

† Uber die anwendung der Sabina by der gicht, &c. 1794.

‡ Alibert. Burdach.

of poultice. As an escharotic application to venereal warts and other fungous excrescences, the powdered savin is not unfrequently employed. And an ointment made of it is one of the most excellent applications we possess for keeping up a discharge from a blistered surface.

It is given in substance in the dose of from one to two scruples three or four times a day. It is almost impossible to pulverize it without previously drying it in a high degree of heat; and, as the active part is an essential oil, very readily volatilized by heat, the powder is always an improper form for exhibiting it. The best way is to beat it up with honey, or with any kind of syrup, into the consistence of a conserve. A decoction of one ounce of the leaves to one pint of water, boiled down to half a pint, with the addition of two ounces of syrup, may be conveniently given in the dose of a large wine-glass full every two or three hours. The oil is given in doses of from one to six drops. Hartman gives the following prescription, into which savin enters as a most powerful emmenagogue:

℞.—Pulv. hellebor. nig. ℈iv.
Pulv. g. myrrh.
Ferr. ammoniat.
Extract. sabinæ. āā ʒss.

Syrup. croc. q. s. ut, fiant pilulæ ponder. āā gran. unæ. Three to be taken three or four times a day.*

The compound tinct. of savin, L. Ph. is given in the dose of a drachm twice a day.

Formulæ.

℞.—Extract. sabinæ ʒi.
Pulv. cantharid. ʒss.
G. aloes socc. ℈i.—M. Divide into sixty pills. Take one three times daily.

℞.—Tinct. sabinæ comp. ʒi.
—— aloes compos. ʒss.—M. Take a tea-spoonful twice daily.

* Thesaurus Medicaminum, p. 145..

℞.—Fol. sabinæ
Rad. polygala āā ℥ss.
Aq. bullientis ℥xiv.—Simmer down to ℥xii. Dose, a table-spoonful four times daily.

MENTHA PULEGIUM.—PENNYROYAL.

The plant which goes by the name of pennyroyal in this country, is the *cunila pulegoides*, and not the mentha pulegium, as is commonly thought by those who are not acquainted with botanical distinctions. These two plants, however, are so nearly allied to each other, both in botanical character and in their sensible properties, that we would be led, *a priori*, to expect, which in fact appears to be the case, an entire similarity in their medicinal powers.

As a popular remedy for suppressed menstruation there is, perhaps, no other article so generally employed. Its emmenagogue virtues are, however, extremely problematical. Cullen considered it as perfectly useless in this respect, although he thinks it of service in "the dyspeptic and spasmodic symptoms of the stomach," which some females experience about the period of menstruation. From my own experience I can say nothing in favour of this article, although I have prescribed it very frequently. As a vehicle for the exhibition of other emmenagogue remedies, an infusion of the pennyroyal is much in use in some parts of Europe, and in the interior of our own country.

ROSMARINUS OFFICINALIS.

The rosemary is a plant well known in this country as a common garden shrub. It is indigenous to Spain, Italy, and the south of France. Water draws from it

a bitter extractive matter. A very odorous, resinous principle is extracted from it by alcohol. It also yields a very pungent essential oil by distillation. Proust has discovered a sixteenth part of camphor in this oil. M. Margueron has found that oil of rosemary decomposes the nitrate of mercury, the oxymuriate of mercury, the yellow sulphate of mercury, and the caustic muriate of antimony.* It is much in use as a domestic remedy for obstructed catamenia, and it would appear from the testimony of several respectable writers, that its powers as an emmenagogue are not inconsiderable. Cullen, however, attributes to it no virtues in this way. Dr. Chapman, on the contrary, gives it a better character, and alleges that he has used it in several cases "with unequivocal success." Murray does not mention it as an emmenagogue. I have employed it in but a very few cases, and can therefore say but very little of it from my own experience.

As a warm, aromatic stimulant, it may often be given with much advantage in nervous disorders, such as vertigo, palsy, and spasmodic pains of the stomach. It has also been extolled in the treatment of glandular swellings in infants.† But its usefulness, says M. Alibert,‡ is particularly conspicuous in chlorosis, a disease which is very generally complicated with a weakness of the abdominal viscera, or an aberration of their sensibility. The same author states, that a vinous infusion of this plant is an excellent remedy in chronic diarrhœa.

It is generully used in the form of an aqueous or vinous infusion. The essential oil is given from two

* Alibert, Matière Med. vol. ii. p. 127.

† J. C. Speis Rosmarini Historia Medica. Helm, 1818.

‡ Nouveaux Elémens de Thérapeutique et de Matière Médicale, vol. ii. p. 128.

to ten drops, on sugar. Rosemary is a principal ingredient of the preparation known under the name of Hungary water.

RUBIA TINCTORUM.—MADDER.

This is a perennial plant, and cultivated as an article of commerce in different parts of Europe. The root, which is the only part of the plant employed, is long, slender, of a red colour, and succulent, with a white ligneous pith in the centre. Its taste is slightly bitter and somewhat austere, and imparts both its taste and colouring principle to water.

When given to animals with their food, it soon gives a red tinge to the bones and the urine. Mr. Gibson* of Manchester, has experimented largely with this article, in relation to its effects upon the bones and secretions of animals, and he has established the fact that its colouring principle is manifested only where it meets with phosphate of lime, which acts as a mordant in fixing and evolving it.

It is chiefly upon the evidence of Dr. Home in favour of its emmenagogue virtues, that its claims to notice are founded. By this eminent physician it was regarded as the safest and most powerful emmenagogue known. He asserts, that out of nineteen cases treated with this remedy fourteen were cured. By the late Dr. Barton, also, it was thought to possess no inconsiderable powers in this way. Respectable as these testimonies are, it is still very doubtful whether this article possesses any such powers. Very few physicians employ it at the present day; and whatever may be its virtues, it does not possess the confidence of the profession as a reme-

* Transactions of the Manchester Literary and Philosophical Society.

diate article. I have employed it frequently, but never derived the slightest advantage from it. It appears, indeed, to have very little influence of any kind upon the functions of the animal economy; nor has Cullen's suspicion with regard to its supposed deleterious qualities ever been confirmed. It is given in substance, in the dose of from one scruple to two drachms.*

POLYGALA SENEGA.

This plant, indigenous to the United States, is entitled to very great attention for its various and important medicinal virtues, whatever we may think of its powers as an emmenagogue.

Dr. Hartshorne, of this city, appears to have been the first who noticed the emmenagogue virtues of this article. Dr. Chapman speaks of it in the highest terms of praise. "Of all the emmenagogues which I have tried," says he, "this is the most efficacious, and will be found useful in all forms of amenorrhœa." And again: "I have used it with sufficient success to warrant me in recommending it as one of the most active, certain, and valuable of the emmenagogues." From my own experience, however, as well as from that of some of the most respectable physicians of this city, I am led to a very different estimate of the powers of this remedy as a promoter of the menstrual discharge. I have tried it repeatedly, but hitherto uniformly without success. I am not, however, disposed to regard it as wholly inert in this respect. The testimony in favour of it is too respectable to allow me to doubt its occasionally mani-

* Dr. Colhoun informs me that he saw a case of amenorrhœa, in the Pennsylvania Hospital, in which ℥ss. was given by mistake, instead of ʒss. It produced a slight discharge of blood from the uterus. The medicine may, therefore, be usually given in too small a dose.

festing such powers. I am nevertheless entirely convinced that Dr. Chapman has expressed an opinion much too favourable of its efficacy as an emmenagogue.

It is best given in the form of decoction. An ounce of the bruised root to a pint of boiling water, and boiled down one-third, will make it sufficiently strong. Three or four ounces of this decoction must be given during the day. It should be commenced six or eight days previous to the regular period of menstruation, and gradually increased to as much as the stomach will bear.*

CANTHARIDES.

Agreeably to the ideas given in the commencement of this chapter, concerning the modus operandi of emmenagogues, we should be led, *a priori*, to expect such virtues in cantharides: for they have undoubtedly a very considerable tendency to determine the circulation to the pelvic viscera.

The emmenagogue properties of cantharides have been noticed by Allen,† Adair,‡ and Burdach.§ The latter writer says: "In obstructions of the catamenia, arising from debility and torpor of the uterine system, fly plasters laid on the lower part of the abdomen, or on the sacrum, have been known to do good; or the tincture of cantharides may be given internally, in combination with tincture of aloes." Adair recommends this latter combination as very useful in amenorrhœa. Allen, in enumerating a variety of emmenagogues, mentions cantharides in union with camphor, but makes no

* Chapman's Therapeutics and Materia Medica.

† Synopsis Medicinæ, vol. ii. p. 235.

‡ Essays on Fashionable Diseases, &c.

§ System der Arzneimittellehre, B. iii. s. 107.

further observations as to the powers of this mixture. Within a few years past Dr. Joseph Klapp, of this city, has directed his attention particularly to the emmenagogue virtues of this article, and has published the result of his experience upon this subject, furnishing thereby much interesting evidence in favour of the existence of such properties in cantharides.*

In my own practice I have found this article to display very decided emmenagogue virtues in several instances. In the majority of cases, however, I have found it to fail in common with other articles of this class.† In exhibiting this remedy, it is necessary to attend to the state of the general system. When the habit of body is full and inflammatory, venesection ought always to be premised to the exhibition of this medicine. In cold and phlegmatic temperaments, its action in this way would seem to be most conspicuous. It seems to be peculiarly adapted to those cases of amenorrhœa which are attended with fluor albus. In this affection it appears to do good by exciting the mucous membrane of the uterus and vagina to a new train of actions, independently of its powers to increase the determination of blood to these parts.

Twenty drops of the tincture is to be given three times a day, and gradually increased until symptoms of strangury supervene.

ALOES EXTRACTUM.

The natural history of this article has already been given under the head of Cathartics. Agreeably to the

* American Medical Recorder.

† I was directed to the employment of cantharides, as an emmenagogue, by Dr. Klapp's publication, prior to which I was not aware that this article had ever been used for such purposes.

opinion expressed in the beginning of this chapter, relative to the modus operandi of emmenagogues, there is no difficulty in perceiving how aloes should prove emmenagogue, independent of any specific virtue in this way. When speaking of this article before, its peculiar tendency to act upon and stimulate the rectum was particularly pointed out. The effect of such an irritation, by a well-known law of the animal economy —*ubi iritatio ibi fluxus*—is, an afflux of blood to the rectum and neighbouring organs. Hence the pernicious consequences of aloetic purges in persons labouring under hæmorrhoidal affections. In cases of this kind it is exceedingly apt to bring on bleeding from the tumours in the rectum, or, at least, to render them turgid and inflamed. In males a long course of aloetic medicines seldom fails to bring on piles. In females, on the contrary, where there is no strong tendency to hæmorrhoides, it more commonly brings on copious discharges of blood from the uterus, or in amenorrhœa, re-establishes the regular flow of the catamenia. In patients of a delicate and relaxed habit of body, with a constipated condition of the bowels, we may often derive very great advantage from a combination of aloes, steel, and myrrh. Where amenorrhœa is connected with hæmorrhois, which is not unfrequently the case, aloes is an improper remedy. Instead of re-establishing the menstrual discharge, it is apt to increase still further the hæmorrhoidal affection; and by thus establishing a more copious discharge from the vessels of the rectum, a derivation from the uterine vessels, and with it a diminution of the menstrual effort takes place. In chlorotic females small doses of aloes and iron will sometimes produce very happy effects. I have known it to be prescribed with prompt success in a case of amenorrhœa, in combination with pulv. ipecacuanhæ, in the proportion of ten grains of aloes

to one grain of ipecacuanha, every morning, noon, and evening. The semicupium is an excellent auxiliary to this, as, indeed, it is to all the other articles of this class. It does not appear that the emmenagogue effects of aloes is proportionate to its cathartic operation. Small doses, just sufficient to unload the bowels, will, in general, do better than such as are large and more active in their purgative effects.

Formulæ.

℞.—Pil. aloes cum. myrrh.
—— ferri comp. āā. ʒi.
Sodæ sub-carbonat. ℈i.—M. Divide into thirty pills. Dose, two twice daily.

℞.—G. aloes soccot. ʒss.
Prussiat. ferri ʒi.—M. Divide into sixty pills.—S. Take one three times daily.

℞.—Tinct. aloes compos. ʒi.
—— secale cornut. ʒii.—M. Dose, a tea-spoonful twice daily. I have used this combination with prompt success in several instances.

POLYGONUM HYDROPIPEROIDES.

Water-Pepper, Biting Knot-weed.—Although this plant has, hitherto, not been included in the list of our vegetable materiæ medicæ, my experience with it, as an emmenagogue, has induced me to regard it as justly entitled to a place among the remedial agents of this class.

This species of polygonum is extremely common throughout every section of the United States. The stem rises to the height of from about twelve to twenty-four inches, is slender, smooth, branching, and erect. The leaves are lanceolate, very acute, and end at the base in a short compressed sheathing petiole. The stipules are truncate and pubescent. The flowers are in one or two simple slender spikes, and of a pale pink, or white colour. It flowers from July to September.

I have employed this plant in perhaps twenty cases of amenorrhœa, and I can affirm, that with no other remedy or mode of treatment have I been so succesful as with this. I have seldom found it necessary to continue its use for more than six or seven days, before its emmenagogue powers were manifested. When taken into the stomach, it generally produces a warmth and peculiar tingling sensation throughout the whole system. I have never known it to cause either purging or vomiting; but in nearly all instances, its use was attended with slight aching pains in the hips and loins, and a sense of weight and tension within the pelvis. Several of my medical friends, who, at my request, have employed this remedy in amenorrhœa, found it, in the majority of cases, promptly effectual. I use it in the form of a saturated tincture. A tea-spoonful of the tincture should be taken three times daily. It may also be advantageously used in the form of an extract. From four to six grains of the extract may be taken every six hours.

II. *Medicines that Increase the Parturient Action of the Uterus.*

ABORTIVA.

SECALE CORNUTUM.—ERGOT.

This article is a parasitic fungus, occupying the glumes of the rye, (*triticum secale,*) of the genus sclerotium, and natural order fungi. For an interesting account of its natural history, the reader is referred to

a paper by Dr. William Tully, published in Silliman's Journal of Science and the Arts, vol. ii. p. 48.

There is no article of the materia medica more eminently calculated to excite our admiration of that wonderful and mysterious connexion of the various organs of the animal economy, by which a slight impression upon one part is instantly propagated to another, and there manifested often by the most vehement actions.

Taken internally in a large dose, it excites nausea and vomiting, attended sometimes with vertigo, pain in the head, and increased excitement of the vascular system. Its power, however, of increasing the parturient efforts of the womb, is by far its most prominent and important character. As a *partus accelerator*, it stands alone in the materia medica, and is capable, by its prompt and certain operation, of affording the most happy results, in the hands of a cautious and judicious practitioner.

When labour is protracted in consequence of feeble or irregular contractions of the uterus, this medicine, administered under due precautions, hardly ever fails to excite vigorous and effectual contractions. In a large majority of cases the ergot may, indeed, be regarded as a very fit substitute for the forceps and vectis. When once the uterus is under its influence, the parturient efforts generally continue uninterruptedly; the contractions of the womb never totally cease, but keep up a constant propulsive effort. It commonly manifests its operation in twenty or thirty minutes after its exhibition. Sometimes, however, the effects do not show themselves until a much longer time has elapsed. The force of the contractions are often surprisingly vehement; and it is, therefore, obvious that this medicine cannot be given indiscriminately, or

without a proper regard to circumstances. Should it be improperly given, before the os uteri is soft and in a state to dilate, or has already considerably dilated, rupture of the wound might ensue.

If the mouth of the uterus is considerably dilated, and no particular rigidity of the external parts present, it may be given with perfect safety, and with almost a certainty of success.

By some physicians it is supposed that this article exerts a deleterious influence on the fœtus; the life of which, they assert, it not unfrequently destroys. If this be true, it forms, indeed, a very serious objection to its employment. My own experience with this article has not been sufficient to enable me to speak with confidence upon this point. I suspect, however, from what I have myself seen, and from the detailed experience of others, that there is no good foundation for this opinion, and that the cases which have been recorded by some practitioners, as demonstrative of its injurious effects,* are to be considered in the light of accidental coincidences, rather than the positive results of the medicine.†

The cases to which it seems particularly applicable, are:

1. Where abortion becomes inevitable in the early part of pregnancy, and the contractions are feeble with considerable hæmorrhage. In such cases the exhibition

* Vide Dr. Chatart's paper in the Med. Repos. for 1820.

† Dr. Hosack, speaking of this article, says: "The ergot has been called, in some of the books, from its effects in hastening labour, the *pulvis ad partum;* as it regards the child, it may, with almost equal truth, be denominated the *pulvis ad mortem*—for I believe its operation, when sufficient to expel the child, in cases where nature is alone unequal to the task, is to produce so violent a contraction of the womb, and consequent convolution and compression of the uterine vessels, as very much to impede, if not totally to interrupt the circulation between the mother and child."—*New York Med. and Phys. Jour.* vol. i. p. 206.

of this article will not only shorten the sufferings of the patient, but in a great degree remove the danger.

2. In cases of alarming hæmorrhage near the close of utero-gestation, not occasioned by attachment of the placenta over the os uteri, and not accompanied by efficient contractions.

3. In puerperal convulsions in which a speedy delivery becomes necessary.

4. In lingering labour, the os uteri being sufficiently dilated, and the parts properly relaxed.

5. In retention of the placenta from a want of contraction of the uterus.

6. "In subjects liable to hæmorrhage after delivery from laxity and deficiency of contraction."* In such cases the hæmorrhagy may be entirely prevented by the exhibition of a proper dose of ergot fifteen or thirty minutes previous to the time when labour would otherwise be expected to terminate.

7. To restrain hæmorrhagy after delivery.

Ergot has been recommended as an emmenagogue, but I believe upon a very slender foundation. I have prescribed it in four cases, with a view to its emmenagogue effects, but without the least advantage. It seems, indeed, to exert very little influence on the vascular system; and when we consider, that as an *uteri contractor*, it must tend rather to diminish than to increase the quantity of blood in the vessels of the womb, its emmenagogue powers will at once appear very doubtful.

This article was used, out of the profession, as a promoter of parturition, more than a century ago. In regular practice, however, it was not known until Dr. Stearns, of Albany, brought its virtues before the public; and to him, therefore, belongs the merit of having first

* Dr. E. A. Atlee. Vide American Med. Recorder, vol. iv. p. 141.

directed the attention of medical men to the extraordinary powers of this article.

In Europe it was at one time regarded as a powerful and extensive cause of disease. Epidemics of a very fatal character were ascribed to the effects of the ergot, mixed with the rye which was ground up for bread stuff. What foundation there is for this opinion I cannot undertake to say. It appears to me unphilosophical, however, to account for epidemics by ascribing them to a cause which must be always, in a degree, present.

SODÆ BORAS.

Borate of Soda.—Borax.—Borax is found in a native state, both in Europe and in South America; but that which is met with in commerce is almost exclusively obtained from certain lakes in Thibet and Persia by spontaneous evaporation. The borax, in an impure state, is found concreted on the margin of these lakes, from which it is dug up in masses, constituting the *tincal* or *crude borax* of commerce. In this state it is imported into this country packed up in boxes or chests, and requires to be refined before it can be applied to medicinal purposes, or in the arts.

Borax as it is met with in the shops, consists of irregular masses, or in flattened hexahedral prisms terminated by triangular pyramids. It possesses a slightly alkaline and sweetish taste, and manifests alkaline properties when tested with litmus. It is dissolved by twelve times its weight of cold water, and by twice its weight of boiling water. It effloresces on the surface when exposed to the air. "Subjected to a moderate heat, it undergoes the aqueous fusion, swelling considerably, and finally becoming a dry porous mass,

with loss of half its weight." When subjected to a high degree of heat it fuses into a limpid fluid, called *glass of borax*. Dr. Duncan states that borax possesses the property of converting the mucilage of gum arabic, lichen islandicus, or of salep into a gelatinous mass, wholly destitute of adhesive qualities. "It is decomposed by the majority of the acids, by potassa, and by the earthy and ammoniacal sulphates, muriates, phosphates, and fluates." Borax has the property of greatly increasing the solubility of cream of tartar, combining with it, and forming *the soluble cream of tartar*. "This preparation is made by boiling six parts of cream of tartar with two parts of borax in sixteen parts of water, for five minutes, allowing the solution to cool, and then filtering to separate some tartrate of lime." It is then to be evaporated to dryness by the heat of a sand-bath. Among the Germans, borax is now frequently employed as an internal remedy. It is said to possess anti-spasmodic properties, and to exert a peculiar tranquilizing influence on the nervous system, without increasing the action of the heart and arteries. Richter asserts, that it tends very considerably to increase the determination of blood to the abdominal and pelvic viscera, and to excite the portal circulation.

In the aphthous sore mouth of infants, borax is much employed in this country, either in the form of a mouth-wash or of powder. Pitshaft says, that when this affection is attended with acidity in the primæ viæ, which is almost always the case, the most effectual mode of using the borax is to give it internally, in union with magnesia. From two to four grains of the powdered borax, with five or six grains of carbonate of magnesia should be given two or three times daily, at the same time that a solution of the borax is repeatedly applied to the aphthæ of the mouth, by means of a

soft pencil, or lint fastened to the end of a thin piece of whale-bone. Borax is undoubtedly the most effectual remedy we possess, as a local application for the cure of aphthæ. In that distressing aphthous affection which sometimes occurs on the internal surface of the pudenda of pregnant females, the application of a strong solution of borax generally procures speedy relief.

Richter says that borax possesses excellent emmenagogue virtues. We have also the testimony of Lentin, Stark (Einricht. des Klinisch. Instituts. &c. Jena, 1782), Bayler, Hufeland (Hufe. Journal, B. 9, p. 127), and Kopp (Beobacht. im. Gebiete der ausub. Keilkunde 1821, p. 134), in favour of the usefulness of this article in amenorrhœa, or uterine torpor. Kopp declares that he has employed this remedy with peculiar success in deficient or obstructed menstruation, attended with general plethora, or a febrile habit of the system. He gave from four to six grains of the powdered borax four or five times daily. Richter states that he gave this article in a case of chorea attended with amenorrhœa. After its use had been continued for seven or eight days, the menses began to flow, and the choreal symptoms to subside. Twelve grains of the borax were administered three times daily. Hirschel says (Hufeland's Jour. vol. 52, p. 27) that he gave fifteen grains, mornings and evenings, and thereby restored the catamenial function, after it had been for more than two years wholly suppressed. Borax has also been used with advantage in deficient or suppressed lochial discharge. (Oswald.)

Of late years, this article has been much used by Wiegand, Rudolph, and others, for increasing the parturiant contractions when too feeble from atony or torpor of the womb. Jahn asserts, that he has often

known a few full doses of borax in union with safron, to excite, in a short time, very powerful and effectual labour-pains, and that it very rarely failed to produce an obvious increase of the parturient efforts of the womb. He gave from twenty to thirty grains of the borax with five grains of safron every hour. Lœffler, also, declares, that during a long course of experience, he has almost uniformly found the borax useful in expediting labour, when arrested or lingering from atony or torpor of the uterus; and Krandendonk (Frorieps Notizen, vol. xix. p. 96) has published statements equally favourable to its virtues in this respect.

Besides its usefulness, as an external remedy, in aphthæ, borax has also been found highly beneficial in inflamed hæmorrhoidal tumours, superficial excoriations, sore nipples, and certain cutaneous eruptions. Harless recommends the use of a mixture, composed of one drachm of powdered borax, the yolk and albumen of an egg, one ounce fresh almond oil, and half a drachm of bals. peruv. as an application to excoriated or ulcerated nipples. Hufeland declares, that a solution of half a drachm of borax in an ounce of rose water, is one of the most prompt and certain means we possess for removing those yellowish blotches (Lichen) which often appear on the face, neck, and chest of young people. It is also an excellent remedy for chilblains. For this purpose, two drachms of the borax must be dissolved in an ounce of water, and applied to the affected parts several times daily, by means of a small piece of soft sponge. Reinhart (Hufeland's Jour. vol. lxv. p. 121) employed a strong solution of borax in four cases of pityriasis (dartre furfuracee volante) with entire success. It is said to be an excellent remedy for removing opacities of the cornea. Richter employed it for this purpose with great advantage.

Half a drachm of the borax, with double the quantity of white sugar, is to be dissolved in an ounce of rose-water. Five or six drops of this solution must be introduced into the eye two or three times daily. (Anfangsgr. d. Wundarzneik. B. iii. p. 127.)

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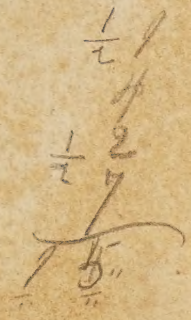

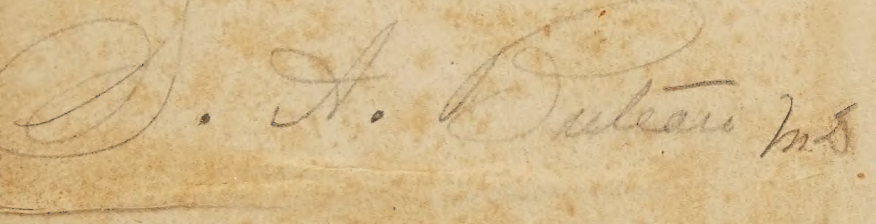

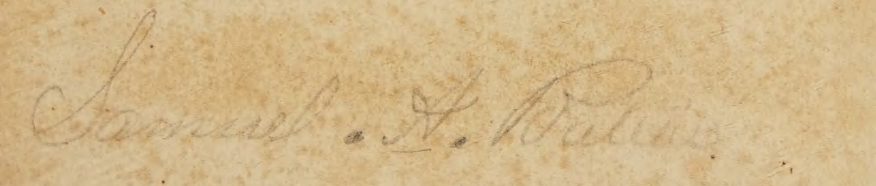

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